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Italian Secondary School Students and the Distance Learning Experience: From Current Critical Issues to Future Opportunities, Reflecting on VR

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Italian Secondary School Students and the Distance Learning Experience: From Current Critical Issues to Future Opportunities, Reflecting on VR

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Abstract: This paper aims to identify Distance Learning adaptation profiles of a sample of Italian secondary school students, placing attention on the factors connected with a decline in school performance, digital inequalities, cognitive-emotional distress, forms of exclusion. DL increases the risk of distraction/interruption and affects academic performance; it has a negative impact on interactions between peers and with teachers by and large, causing a considerable number of interviewees to feel “deprived of quality relationships”. The profiles that emerged highlight the existence of forms of inequality that are known to predate the pandemic. The problem of access to the Internet/technology and the issue of inadequate domestic space exacerbate every other criticality identified. The data, however, allow for observations that go beyond an interpretation built exclusively around the digital divide. DL, even when delivered at optimal levels in terms of connectivity and educators’ digital competence, has jeopardized the regular execution of social processuality, a veritable belt drive of curricular knowledge. In the wake of technological advancement, accelerated by the pandemic, therefore lies the hope for wider experimentation with digital classrooms using VR technology, hinged on multidisciplinary dialogue and aimed at translating the digital from a form of technological virtuosity, to a credible and ethically grounded response.

Keywords: Distance Learning, Secondary School, Educational Inequalities, VR technology

1. A *web survey* targeting students in Italy: introductory note to the survey

Since March 2020, a month sadly remembered for the explosion of a global health emergency, and the enforcement of the first nationwide lockdown, Distance Learning (DL), as an educational solution in a world besieged by Covid 19, embodied a radical and unexpected change of pace for all Italian students. Despite the massive investments for the digitalization of teaching, in schooling contexts of all levels, the academic world has encountered numerous critical issues and registered – as did society as a whole – an exacerbation of social inequalities and a widening of pre-existing gaps (Ciurnelli & Izzo, 2020; Nuzzaci et al., 2020; Lombardo & Mauceri, 2020; Ghigi & Piras, 2021; Saraceno, 2021, Ist. Toniolo, 2021). However, its negative effects such as the increase in study load, lower perceived effectiveness of training activities in terms of learning, the inadequacy of the innovative solutions implemented and the worsening of interactional dynamics, just to name a few, have affected a large number of students, in particular those in secondary schools (Fasanella et al., 2020).

The proposed paper, focusing on a section of data from a broader matrix, intends to *identify the main DL adaptation profiles* within a *sample of Italian secondary school students* (the cases reached being 6,689 in total, while the classes selected for the survey, two in all per institution, were second and fourth year students), paying specific attention to the factors connected with decline in school performance, digital inequalities, cognitive-emotional distress, forms of marginalization-exclusion. Therefore the object of this work is to evaluate the *impact of DL on students' lives*, accomplished by way of reference to the perception of this rendition of teaching, in a comparison between remote and in-person teaching on a series of aspects which affect the sphere of *sociality* (in terms of interactions and relationships with peers and teachers), the sphere of *energies spent* (repercussions vis-à-vis time management, commitment required, study load), those of *effectiveness* (effects on appeal, learning and skill acquisition), and *performance*.

The referenced survey, a closed web survey (the online questionnaire included 68 questions, almost all of which are standardized – Mauceri, Faggianno & Di Censi, 2021) funded by Sapienza University of Rome and launched in mid-February 2021 (end of survey: mid-April 2021), comprised 209 out of the 1,599 schools in the regional and provincial capitals of Italy (overall percentage of return calculated on schools: 13%)¹. It concerned various aspects

¹ Based on the complete list of contacts organized by school and territory, an invitation email was sent to school administrators, about two months before official launch of the survey containing – in addition to the questionnaire file, subsequently used in digital form – specific references with respect to the body that sponsored it (University, Department,

of young people's daily life (schooling, family life, free time, use of digital platforms, etc.), including the exposure to DL².

Among the agents of influence considered in order to evaluate the impact of new technology on training and academic programs are:

1. classic *socio-demographic variables* (gender, age, region / area of residence, nationality, structure of family unit, family's cultural capital, parents' occupation, etc.);
2. variables pertaining to the *environment in which DL is introduced* (assessment of the available technological equipment – both domestic and institutional – and of the characteristics of the living space, which is often shared – in the context of the pandemic – with other subjects in DL and / or Smart Working frameworks);
3. variables connected with *family dynamics* and with the *system of social and cultural relations / opportunities cultivated within the household environment*;
4. variables associated with *academic performance* and with the *quality of relationships within the context of school*.

With respect to the socio-demographic characteristics of the sample, it is possible to state that the variables of *gender* (Boys: 48.2%; Girls: 51.8%) and *age* (15-16 years: 45.3%; 17 years and over: 54.7%) are by and large balanced. *Italian nationality* prevails (92.5%) as well as *affiliation to a gymnasium-type*

Observatory, Coordination), the scientific objectives, survey methodology, the intended use of the research results. A meticulous reminder plan was developed (three in all, sent out every two weeks) and, once individual membership was obtained, the research collaboration was then achieved thanks to the active role of a teacher-representative for each institution involved, an invaluable link between students and research teams. The survey was carried out in the classroom over an entire class period, where the students selected (by the school, on the basis of the research group's specifications, aimed at reaching as heterogeneous and wide a sample as possible – with regard to parameters such as gender, nationality, school performance, etc.) completed the questionnaire online, mostly on their smartphones (sometimes using the schools' PCs or tablets). Although the sample obtained is not statistically representative (due to the non-random selection of classes), it is nevertheless important to underline that, when comparing population and sample with respect to the variables of *course of studies* and *geographical area*, no particular imbalances emerged: 1. *Course of studies among the population* – Gymnasiums: 44.2%; Technical Institutes: 22.8%; Vocational Schools: 21.3%; Mixed Institutes: 11.7%; *Course of studies within the sample* – Gymnasiums: 42%; Technical Institutes: 27.8%; Vocational Schools: 25.4%; Mixed Institutes: 4.8%; *Geographical area in the population* – North-east: 14.9%; North-west: 28%; Midland: 24.4%; South: 20.8%; Islands: 11.9%; *Geographical area in the sample* – North-east: 15.3%; North-west: 23%; Midland: 25.8%; South: 28.2%; Islands: 7.7%. There is a lot more empirical evidence that would allow us to investigate the population-sample comparison, even at bivariate and trivariate level, but, for length restrictions, these analyses and reflections have been deferred to a different time and place.

² The study, entitled *Critical Thinking and Cognitive Populism in the Digital Platform Society*, falls within the activities of the Electoral Sociology Observatory of the Sapienza University Department of Communication and Social Research (Scientific Head of the Observatory/ Research Coordinator: Prof. C. Lombardo).

school setting (49.6%)³; furthermore, Northern Italy is over-represented (42.5%), compared to the Midland (23.4%) and Southern (34.1%) regions⁴. Some regions stand out, revealing themselves as particularly receptive to this research initiative, on which executing further in-depth analyses will certainly be of great interest in the future (Lombardy: 19%; Lazio: 15.6%; Apulia: 13.4%)⁵.

Student profiles with the following characteristics are particularly widespread: *medium-low cultural capital* (61.5%), *two working parents* (61.3%), *two-parent families – with siblings* (66.2% – to which the percentage of 17.4% is added, relating to family contexts where both parents are present but siblings are not). Relevant for the purposes of the conducted analyses, are those lesser but far from negligible family situations, characterized by some form of socio-economic hardship (in 32.9% of cases only one parent works, in 5.8% both parents are unemployed; moreover, in 16.3% of cases the interviewees highlighted the absence of one or even both parents from the family unit).

2. The context in which DL is introduced

Now, aiming to identify the salient characteristics regarding the *context in which DL is implemented*, inevitably connected with exceptionally longer periods of time spent at home compared to the pre-pandemic phase, the following can be mentioned, in schematic form:

- the *available spaces at home (for the purposes of study, leisure, etc.)* is considered *completely inadequate* by 21% of the interviewees, and defined as *adequate only in part* by 25% of them⁶.
- *At least one remote worker is present* at home in 30.1% of cases: a significant portion of respondents thus share their living space with a parent (if not both) in need of a workstation and bandwidth and who, though in

³ If on the basis of the population-sample comparison, carried out using the aggregate data (unit of analysis: individual school), the percentages calculated in terms of course of studies are not too far removed from each other (see note 1), on a micro level (percentages being calculated on an individual basis) the disproportions increase: 1. Gymnasiums: 49.6%; Technical Institutes: 35.3%; Vocational Schools: 15.1% (gymnasium students and technical institute students are clearly characterized by greater participation in research).

⁴ In this case, observing the most analytical piece of data on the sample as well, in line with that proposed in note 1, the proportions seem to be essentially respected; in fact, the percentages relating to the *geographical area of origin* are, on the micro level, the following: North-East: 17.5%; North-West: 25.1%; Midland: 23.4; South: 27.8%; Islands: 6.2%.

⁵ In this regard, it is worth specifying that the regions of Lazio and Lombardy, with percentages of 14.8 and 19.3 respectively, are over-represented to begin with in the reference population, while Apulia, in terms of schools surveyed, stands at 5.3%, turning out to be, microdata at hand, a real surprise on the front of student response to research.

⁶ This evidence seems to be connected with a problem of disparity in terms of access, which in Italy has exposed a quarter of DL students to the (explicit or implicit) risk of dropping out. For further information, see. Cidi-Torino (2020).

a condition of work flexibility, is not always or necessarily in a position to monitor and follow the child/children's remote school activities⁷. The parent working from home and the child learning remotely simultaneously lend themselves to being interpreted as a dyad in the most favorable conditions – aside from the stress generated by the restrictions aimed at containing the spread of Covid 19 – with respect to a profitable exchange of skills, and the most fruitful adaptation to DL/to the dematerialization of tasks and work functions. On the one hand, is the *remote worker* (summarily *hyperconnected* and with ad hoc, full immersion training on the use of specific platforms, in some cases the same ones used by children on the educational front); on the other, are the children, teenagers and youngsters, *quintessential inhabitants of the platform society* (van Dijck, Poell & de Wall, 2018; Italian edition ed. Boccia Artieri & Marinelli, 2019).

- Completing the point above, in the family unit there are *other subjects in DL programs* (at least one) in 66.7% of cases (in 21.9% both DL and Smart Working (SW) subjects are recorded within the home): again, on the one hand, possible sources of stress emerge (in relation to: physical spaces, the necessary technological equipment and connectivity, potential noise and interference, etc.), on the other, available and advantageous forms of cooperation (sharing and exchanging skills, mutual help and monitoring, etc.⁸).
- *Internet connection*, essential to follow lessons and work individually / in groups for assigned tasks and set objectives, when pertaining to the *household*, is considered inadequate by 14.2% of the interviewees, when pertaining to the *school* it is defined as “not up to the situation” by over 60% of them (61.6% more precisely – the evaluation in terms of inadequacy concerns both their home and their school in 8.7% of cases; significant percentages, clearly, considered that the survey took place not at the beginning of the pandemic, but in its second year)⁹. Although the

⁷ In the research report published by Lombardo & Mauceri (2020), as in many other studies carried out throughout the pandemic focusing on the social effects of Covid 19, it emerged that, smart workers, and especially women working remotely, have seen their working time considerably increased in terms of hours and days, and experienced an increase in workload, along with the intensification of household activities, greater stress, higher risk of distractions/interruptions/interferences.

⁸ In the study mentioned in note 7, the domestic contexts within which, in addition to the interviewee, one or more people “work remotely” and/or “learn remotely”, appear as veritable “forges”, complex microcosms within which, in some cases, fruitful and unprecedented synergies develop, in others, differing needs and demands clash.

⁹ In line with the data presented, in the 2021 Youth Report by the Toniolo Institute, what surfaces, on one hand, is the confidence of most students in the institution (considered by most as the main context for honing their *skills, including soft skills*) and educators (individuals generally considered as capable of transferring high-level content, important values and *problem-solving skills*), although it's *not a blind* trust and, *with reservations*, as it were. However, the critical attitude of students prevails, again the majority, with respect to the

perceptual data presented here need to be weighed against their objective counterpart (aimed at a targeted and timely evaluation of the current technological equipment present in the Italian school system), carrying out checks on the heels of an interpretative dimension that we could define as the *density/functionality of the connection*, there are no significant differences in the evaluation the internet connection at school among interviewees who share or don't share their living space with other subjects in DL and/or SW frameworks. 52.8% of the interviewees, with almost identical percentages within all the identified types (*neither DL, nor SW subjects present at home; only SW subjects present at home; only DL subjects present at home; both DL and SW subjects present at home*) reviews the quality of their school connection negatively, the latter being a fundamental requirement for DL to function properly. Even among those who define, against the backdrop of restrictions, their available home space as inadequate as concerns studying, leisure and privacy, in 51% of cases view their home connection as better than their schools in alignment with those respondents not characterized by the same hindrances.

- Among the available technological devices within the domestic walls, and not necessarily for exclusive use (much more often shared), laptop computers prevail (85.6%), followed by Tablets (57.4%) and, thirdly, by desktop computers (38.9%); only 2.5% of students appear to be devoid of any device (although the percentage is very low, these data require further investigation).

3. The interviewees between family and school

A series of results concerning both school and family contexts can help to shed light (especially in the presence of fast-moving processes of innovation and veritable splits from the past) on a “baggage” – a rich and solid result of varying proportions – fundamental to the respondents for the dynamics of learning and adaptation in which they are inserted. The reference is to the points of *emotional experiences, cognitive stimuli, the origin of the processes initiated* and the *quality of the itineraries in place, relational systems, social and cultural opportunities* (Fasanella & Lombardo, eds., 2017), oftentimes in a comparison between *life before and after the Coronavirus*¹⁰.

technological equipment of schools (including the quality of internet connections) and the ability of educators to offer innovative didactics, which can, for that matter, measure up to the emergency situation. Furthermore, if in the survey presented here the percentage of distrust towards teachers, together with other *red flags*, skirts a third of the interviewees (result which warrants the utmost attention), in the Toniolo Institute survey as many as 15% of interviewees conclude that the Italian education system, as it stands now, is worthless.

¹⁰ Regarding the Coronavirus, one could briefly recall that, apropos the *forecasts about the*

The principal features gathered are summarized as follows:

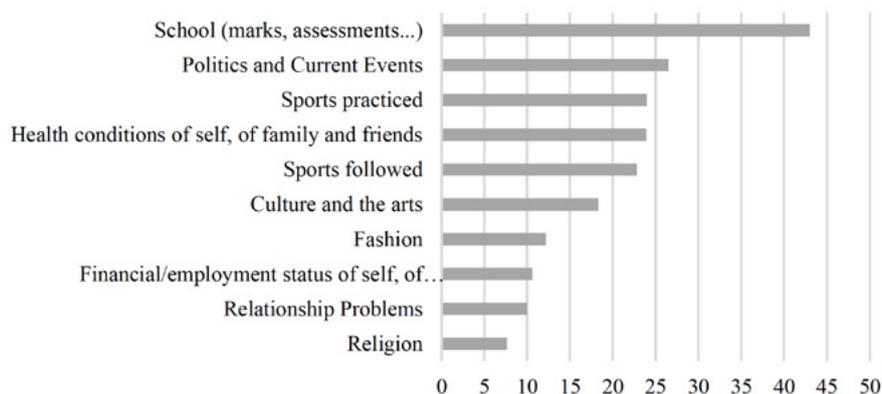
- As for the *possibility of relying on the adult world when the need arises*, 61.5% of respondents view their parents as a safe haven (when combining the data, 31.2% of students declared that they can rely on both parents and teachers for problems and advice). The proportion of those who say they *have no one* to rely on is modest (6% – a percentage that increases to 7.3% if we aggregate the data in the *somewhat on teachers* modality).
- 17.1% of youths interviewed say they still suffer because of an argument, a misunderstanding, or an act attributable to a family member; what is reported through the questionnaire is, in other words, an episode that occurred within the last year, which continues to have negative effects on the present.
- The quality of the familial atmosphere, measured through an additive index (battery of questions/0-5 scale associated with 6 adjectives, 3 being positive and 3 negative) can be classified as positive on the whole in 61.3% of cases, ambivalent/negative in the remaining 38.7%.
- The comparison of *life before and after the pandemic* reveals that for 12.7% of youngsters, life “remains” unsatisfying (long-standing discontent), compared to the 41.3% who lament a decline in their quality of life on account of the pandemic (life previously satisfying, no longer since the first lockdown). Life, on the other hand, remains satisfying for 37% of the subjects reached and has reportedly improved, even, for 9% of them. On the other hand, the *level of intensity as to family life from a social and cultural point of view*, obviously before the advent of Covid (additive index built from the frequency of participation in excursions-outings, dinners-parties, trips to the cinema, theaters, museums), is medium-high in 52.9% of cases, low for the remaining 47.1%. Moving on to *the opinion on leisure time habitually spent within the family*, interviewees believe that they have greater opportunities for leisure/conviviality than their peers (friends and schoolmates) in 33.8% of cases, equal opportunities in 49.6% of cases, and fewer opportunities in the remaining 16.6%; the subjects classified as dissatisfied as far as leisure time spent with their family are 17.3%.

end of the pandemic, many students do not know how to formulate a hypothesis and do not even try to guess (29.3% answered *I do not know*); more than a few (to the tune of 17.2%) envision a long and tiresome emergency, dating the *resolution of the Coronavirus problem to after 2022* (in some cases stating that *Covid 19 will never be overcome*). In the study by the Toniolo Institute, mentioned several times, it is clear that living at the time of the Coronavirus has largely affected and reduced the planning for life (first of all, in the training and professional spheres) and, more generally, forward-looking focus (see also Lombardo, Faggiano & Sabetta, 2020). Visualizing a lengthy resolution to the health emergency, or not knowing how to predict the end of the pandemic could, in this sense, be interpreted in terms of a lowering of expectations and the rise of less optimistic attitudes compared to the past.

- Among the *people included in the process of collecting useful advice/direction on behaviors to adopt during the pandemic*, parents are prominent (42.9% of total responses), followed by *friends* (23.8%) and *teachers* (16.2%). Among the most widely indicated *contexts of belonging*, regardless of the pandemic, one's *own family* once again comes out on top (24.8% of total responses); in addition, 24.6% of the respondents say they feel connected exclusively to themselves, while 18% mention their *circle of friends* (18%).

With regard to *the intensity of family dialogue/the variety of issues addressed in the domestic context* (in this case, the question is of a general nature and does not aim to make a comparison between before and after the Coronavirus), there is an interesting and conspicuous link between school and family (an additive index was built on the basis of the frequency of discussion on a vast array of issues, and it emerged that the subjects characterized by limited/almost nonexistent dialogue are 16.4%). In fact, *school* (marks earned, questions asked, climate and interaction dynamics, etc.) is by far the most discussed topic in intra-family dialogue. Below is (Chart 1) an interesting ribbon chart presenting, in ascending order, the percentages associated with the periodic family discussion of ten subject matters. Religion and affairs of the heart are the least addressed issues in the family with adults present, certainly for a variety of reasons that deserve investigation, while school, current affairs and practiced sports are the most covered, and most capable of interconnecting the different family members surveyed for the questionnaire.

Chart 1 – Dialogue in the family: Issues that are frequently discussed in the household



Focusing more specifically on school (Fasanella & Lombardo, *eds.*, 2017), given the facts at hand, one could say the element that has most influenced *the choice of which high school to attend* can be found in *individual aptitudes*

(aggregated modality that contemplates internally, for example, the choice based on the presence of classes/courses of study of interest or to which one feels drawn – 76.5%). It is worth mentioning that, in the sample under analysis, high school selection occurred in a self-directed/expressive way in the vast majority of cases (76.5%), in a heterodirected/instrumental way in 23.5% (reputation of the institution, family tradition, proximity of the school to one's home/a parent's workplace, etc.).

School performance over the previous academic year was, almost ubiquitously, at least satisfactory (good or excellent levels of performance predominate in high schools – 55.1% – compared to technical and vocational institutes – 39.7% and 39.5%), with a percentage of particularly bumpy rides totaling 5.4% of cases (3.8% in gymnasiums, 7.3% in technical institutes, 6.2% in vocational schools). *Teachers* are only considered *individuals that can be relied on in case of need* in a third of cases (32.5% – more alarmingly, about 31% of the sample has *zero or, at best, little confidence* in their teachers), while *widespread criticalities crop up on the relational front at school*, due to problems with a schoolmate and/or a teacher (again, in over a third of cases: 35.8%).

Many have a good idea of *what to do after graduation (higher education: 53.6% or working: 19.3%)*, although the undecided (combined, for simplicity, with a residual share of subjects inclined to take a “break”) once again constitute overall a third of the sample (27.1% – 20.4% among gymnasium students/34.7% and 31% among those enrolled in technical and vocational institutes). Among the individuals oriented towards continuing their studies, gymnasium students prevail (75.5% vs 31.8% and 31.9% in technical and vocational institutes); on the contrary, 33.4% and 37% of students in schools traditionally connected with skilled trades see seeking for employment as a natural step, once they finish secondary school (compared to 4.1% in gymnasiums).

4. A year of DL: respondents' opinions and assessments

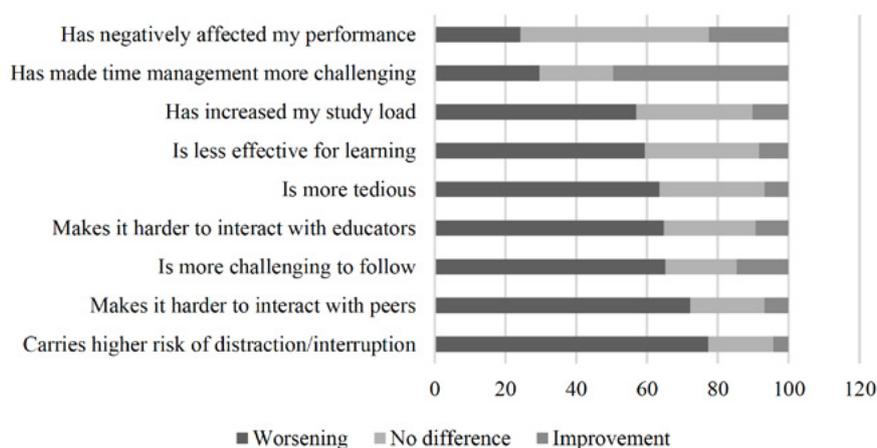
A year after the outbreak of the pandemic, the interviewees indicated their *preferred method of didactical presentation*; even though a preference for traditional in-person teaching was established, with 45.6% of collected replies, the picture that emerged appears rather articulate, allowing us to glimpse experiences, renditions, reasons and differing assessments. In fact, ostensibly, after having experienced hybrid training solutions (mixed didactics is a world unto itself well worth exploring¹¹, also in an attempt to

¹¹ Some authors (Gerosa & Gui, 2018), highlight an over-exposure to the digital by students of low social standing; the use of this new technology by this segment of youngsters is, however, mainly connected to recreational use, while it seems to have negative effects on learning.

imagine and design the school of the future), 30.6% of the interviewees are in favor of mixed didactics, while 23.8% favor DL, seen as a useful tool to be adopted in the school of the future as well, plausibly no longer burdened by the Coronavirus (gymnasium students prefer in-person teaching: 49.4% vs 41% and 43% among those enrolled in technical and vocational institutes; the preference for DL is instead significantly connected with the latter – 27.4% and 25% vs 20% for gymnasium students; other intersections that have proved significant, with $p=.000$, are those based on *gender* and *geographical residence*: mixed didactics-North; distance learning-South; distance learning-male gender being the main results, which will emerge again, later, in the multivariate analysis as well).

Opinions on DL, presented in the ribbon diagram below (Chart 2) in order of ascending diffusion within the sample, has allowed us to reconstruct, analytically, the salient effects that this method of didactic delivery has had on student practices. DL increases the risk of distraction and interruption and, by shifting relationships from the real to the virtual world, has a widespread negative and transversal impact on peer and teacher interaction; moreover, in one case out of four, it also affects, and retrogresses, school performance (which, however, remains unchanged in 53.3% of cases – this is the highest percentage of consistency in the comparison between the pre-pandemic and post-pandemic phases – and it improves 22.5% of the time¹²).

Chart 2 - Opinions on DL



¹² The latter percentage is second only, in terms of the positive effects of DL (modality similar to improvement), to the one related to the possibility of better time management (49.6%). Finally, very few students believe that DL is more effective for knowledge acquisition (8.3% – no difference: 32.2%) or that it has led to a decrease in study load (10.2% – no difference: 32.9%).

It should be noted that all the recorded assessments are expressed with specific reference to one's own experience and do not represent, therefore, general opinions on DL and its repercussions on the figure of the student and on educational institutions.

The joint application of *Multiple Correspondence Analysis* and *Cluster Analysis*, based on the battery of questions referring to the assessment of one's experience with DL (9 items), has made it possible to create a compelling synthesis of the extensive collection of available variables (within which the numerous illustrative variables described in the previous pages are also fully placed).

Firstly, two factors were identified, which explain 35.26% and 13.05% of the common inertia, respectively, named as follows, after careful examination of the different coefficients and factor coordinates:

1. *Effects on the efficacy of the training course* (appeal, learning and acquisition of skills) *and on the quality of the teacher/student relationship* (negative pole: no/positive pole: yes);
2. *Effects on the study load, performance* (number of exams passed, regularity of the course of studies, marks earned, etc.) *and quality of the relationship between peers* (negative pole: yes aggravation and inferior performance, but no difficulty in interacting with peers; positive pole: no aggravation, nor decline in performance, but difficulty interacting with peers).

Based on the extracted factors, through the mixed procedure available on the Spad software, four groups of students were identified, i.e. four main profiles of adaptation/reaction to DL. Below are the names adopted for the clusters, together with the percentage of diffusion of the individual group in the analyzed sample:

1. *First group: Adversarial* (24.9% – Tab. 1) – These are individuals facing serious challenges on the formative and relational level, for whom the disadvantages of the past and the present seem to accumulate and combine in a particularly unpleasant way, and result in the substantial deferral of every project. They are characterized by a consummately *defensive attitude towards DL* (it is no coincidence that they hope for a return to in-person teaching); these are fragile individuals, more often in gymnasium-type institutions, who face various shortcomings and critical issues both at home and at school (they are dissatisfied, alone, without a space nor great attachments), but who, however, perhaps fearful of permanently losing control of the situation, long for a return to school, perceived as the only possible brake in the face of the worsening of already evident hardships.
2. *Second group: Dialectics* (36.9% – Tab. 2) – These are individuals suffering on a relational level on account of Covid (it is a problem pertaining to the

present, not a legacy of the past), who lack interaction with their peers, sociality in the classroom, real-life discussions with their teachers. They show a particular propensity for study and are characterized by an *adaptive dialectic* (they prefer in-person teaching but are also open to mixed learning). There is not an open conflict with DL, given their ability to find new educational balances and to keep their motivation as well as their interest in their own studies alive, likewise projects for their future that, once again, have academics at their center. These are, in general, the strongest high school students, socially (busy parents, high cultural capital, solid system of opportunities and stimuli, etc.), as well as didactically (if one recalls their school performance over the previous year and the absence of negative effects of DL on current performance), emotionally (they can count on solid connections, are satisfied and aware of living a full life, the quality of their relationships in the classroom is high). Focusing on the territorial connotation, students from the North-east are the primary supporters of traditional in-person schooling (or mixed learning): a local society that invests substantially in education and in school organization results in greater schooling, that is, an individual endowment focused on widespread social and cultural resources (Bourdieu, 1979; tr. it. 2001).

3. *Third Group: Consensual Critics* (18.7% – Table 3) – These are individuals who, while preferring DL, express the distress caused by greater workloads and the greater commitment required by the learning activities in progress. Having difficulty with time management too, they *bear the weight of DL*, not supported by their family of origin, nor favored by an expressive and self-directed school choice. Furthermore, although they are characterized above all by the feature of consenting to DL, they do not exclude the possibility of integrating the latter with mixed didactics.
4. *Fourth Group: Consensual Opportunists* (19.5% – Table 4) – These are individuals whose *adaptation to DL*, on a dual *formative and relational level*, conceals a form of *instrumental consent*, at times *uncritical*. For these interviewees, in this case typically from Southern Italy (like the *Consensual Critics* ones), it seems that DL is regarded as an efficient solution, only as far as being a useful tool to get through school quickly and without excessive commitment, as it is a more convenient access key to the world of work. The impression, in other words, is that these interviewees are those *with their cameras and microphones permanently switched off*, lacking any desire towards an active presence in the classroom and, more generally, in school. The impression is also that this attitude may be supported by a possible *complicity between the faculty and the student body* (which would entail the disappearance of monitoring and active guidance by the figure of the teacher, as well as his or her ability to innovate and keep au-

dience attention high). This attitude appears so uncritical, short-sighted and opportunistic – the workload here does not seem to increase! – to the point of surprise in contexts such as technical institutes, known, given their direct link to the occupational sphere, for the involvement of the student body in laboratory activities and in training courses with strong technical-practical components. These young people, eager to wrap up their scholastic activity without too much effort, and already inclined towards the world of work, *seem to be hungry for employment* and, simultaneously, *come from family contexts where there is no employment*; they find themselves in school – now in the *cushy DL parkade* – because of the pressures and conditioning of others, and are perhaps the individuals at highest risk of exclusion. Certainly, they have adopted behaviors, somewhat tolerated institutionally even at the highest levels, which would *not seem to award them great opportunities in terms of social mobility* and which can only contribute to widening, not bridging, social distance and inequality.

Through the following tables (Tabs. 1-4), it is possible to analytically reconstruct (on the basis of the *test-values* reported in order of descending relevance) the process of interpretation and labelling of the identified groups¹³. The key below Table 1, and the text format used, facilitate the recognition of critical and non-critical aspects between the active modes-variables and illustrative modes-variables.

In short, in trying to answer the urgent social question: “*Who bears the brunt of DL?*”, what seems to work, in essence, is the *interpretative key of previous deficiencies, both material and relational*. In analyzing the impact of DL (see the composition of the emerged profiles), an effort was made to *infer the actual weight* of the latter, *moving beyond the estimated, perceived and not always conscious burden* referable to the responses collected.

¹³ The test-value (*test-values*) results greater than 2 in absolute value were reported in the tables in order to highlight, in a simple and direct fashion, the significant associations between individual groups and active and illustrative variables-modes; as mentioned, the test values were gainfully used, together with other available statistics, when interpreting identified profiles semantically and the subsequent labelling of partitions.

Table 1 – First Group (24.9%): Adversarial

<i>Variable Label</i>	<i>Significantly associated modality</i>	<i>Test-value</i>
DL makes time management more challenging	Yes	47,81
DL increases the study load	Yes	36,70
DL leads to a decline in performance	Yes	36,23
DL requires more effort	Yes	35,39
DL undermines the learning process	Yes	35,31
DL is more tedious	Yes	33,50
DL makes it harder to interact with educators	Yes	30,51
DL carries greater risk of distraction	Yes	24,78
Preferred didactics	In-person	24,69
DL makes it harder to interact with peers	Yes	15,50
<i>Changes in own social life on account of the pandemic</i>	<i>Used to be satisfying, now unsatisfying</i>	9,70
<i>Assessment of suitability of available space in the home</i>	<i>Unsuitable</i>	9,55
<i>Degree of confidence in teachers</i>	<i>Low/None</i>	7,33
<i>Relational criticalities at school</i>	<i>Problems with peers/teachers</i>	6,97
<i>Internet connection at home and school</i>	<i>Both inadequate</i>	6,16
<i>Gender</i>	<i>Female</i>	5,92
<i>Quality of familial atmosphere</i>	<i>Ambivalent/Negative</i>	5,04
<i>Satisfaction as to free time in the family modality</i>	<i>Low/None</i>	4,89
<i>Number of electronic devices in the household</i>	<i>At least one</i>	4,63
<i>Able to rely on parents and teachers if necessary</i>	<i>Somewhat on teachers</i>	4,04
<i>Comparison of the modality free time in with family/ others</i>	<i>Fewer opportunities for leisure</i>	3,92
<i>Satisfaction as to free time in the family modality</i>	<i>Satisfied to some degree</i>	3,50
<i>Internet connection at home and school</i>	<i>Suitable at school</i>	3,35
<i>Composition of family unit</i>	<i>Absent parents – one parent present/yes siblings</i>	3,12
<i>Type of institution</i>	<i>Gymnasium</i>	2,89
<i>Number of people that can be relied on if necessary</i>	<i>Small</i>	2,50

Key (Tables 1-4):

Critical aspects active variables

No critical aspects active variables

Illustrative neutral/positive variables

Illustrative variables negative connotation

Illustrative variable: preferred didactics mod.

Table 2 - Second Group (36.9%): Dialectics

<i>Variable Label</i>	<i>Significantly associated modality</i>	<i>Test-value</i>
DL makes it harder to interact with peers	Yes	32,38
DL makes time management more challenging	No	31,05
DL increases the study load	No	30,16
DL carries greater risk of distraction	Yes	29,74
DL makes it harder to interact with educators	Yes	29,68
DL is more tedious	Yes	27,80
DL undermines the learning process	Yes	27,33
DL leads to a decline in performance	No	14,89
Preferred didactics	In-person	8,81
<i>Post-graduation prospects</i>	<i>University</i>	6,09
<i>Academic record</i>	<i>Good/Excellent</i>	6,05
<i>Type of institution</i>	<i>Gymnasium</i>	6,04
<i>Parents' employment situation</i>	<i>Employed</i>	5,38
<i>Quality of familial atmosphere</i>	<i>Positive</i>	5,35
Preferred didactics	Mixed teaching	5,15
<i>Assessment of suitability of available space in the home</i>	<i>Suitable</i>	4,96
<i>Relational criticalities at school</i>	<i>No issues</i>	4,95
<i>Geographical location</i>	<i>North-east</i>	4,67
<i>Internet connection at home and school</i>	<i>Suitable</i>	4,60
<i>Degree of confidence in teachers</i>	<i>High</i>	4,58
<i>Nationality</i>	<i>Italian</i>	4,11
<i>Geographical location</i>	<i>Midland</i>	3,33
<i>Cultural capital of family</i>	<i>High</i>	3,29
Distance Learning requires more effort	Yes	3,26
<i>Composition of family unit</i>	<i>Both parents present/yes siblings</i>	2,99
<i>Intensity of family life in social and cultural terms</i>	<i>Medium-high</i>	2,95
<i>Individuals in Distance Learning or Remote Working frameworks present in household</i>	<i>Presence of RW</i>	2,94
<i>Satisfaction as to free time spent in the family modality</i>	<i>High</i>	2,76
<i>Choice of secondary school</i>	<i>Self-directed</i>	2,75

Tracking a “two-speed” technological advancement within the data, in a framework in many cases characterized by *rocky relationships* and *distrust*, it seems that the individuals most affected by DL, in the gnarly world of secondary school, are those:

with less distinguished records;

- of foreign nationality
- placed in families with serious economic and employment challenges (including *single-parent families*, with *absent parents...*);
- with critical issues on the relational front (family/school – *climate, social capital, trust, dialogue...*);
- experiencing difficulties as to available domestic space (for *studying, leisure...*) and/or household technological equipment (*internet connection/electronic devices*);
- those placed in school contexts with subpar technology and IT equipment; those with limited opportunities for leisure and cultural growth.

The share of *students at potential risk of social exclusion* (groups 1 and 3) that emerges in the sample highlights the existence of *forms of inequality that acceptedly predate the pandemic phase and the introduction of DL* in Italian secondary schools. It is advisable for schools to pay the utmost attention so that these forms of disparity do not grow or worsen, engulfing an ever-increasing number of students. Besides the widely perceived negative effects impacting several spheres (relationships and interactions, time management, learning and study method), DL leads to a *decline in performance and the downsizing of projects* mainly on part of “already” fragile individuals, who are at risk of abandoning their studies and experiencing other forms of social exclusion and probably more so than their peers.

Another fact may evoke particular interest and surprise, and, as mentioned, reflects the close connection between the socio-cultural and territorial context and the academic field (Bourdieu, 1979; tr. it. 2001); and that is *DL as an expedient* (profile 4), an insidious tool and one capable of deeply affecting the traditional functions of the school as well as the role of the teacher. One capable of condemning those young people stuck in that spiral not only to social non-ascent, but essentially to *probable social descent* (plausible consequence of sparse studying, little commitment, the detriment of content and activities, of assigned marks which, instead of being well-founded assessments tied to performance, are at danger of turning into ritualistic practices that can lead to disengagement and a downtrend in planning).

Table 3 – Third Group (18.7%): Consensual Critics

<i>Variable Label</i>	<i>Significantly associated modality</i>	<i>Test-value</i>
DL increases the study load	Yes	23,91
DL undermines the learning process	No	23,27
DL makes it harder to interact with educators	No	18,63
DL is more tedious	No	18,22
DL makes it harder to interact with peers	No	18,13
Preferred didactics	Distance Learning	10,70
DL carries greater risk of distraction	No	7,82
<i>Geographical location</i>	<i>South</i>	4,88
DL makes time management more challenging	Yes	4,82
DL leads to a decline in performance	No	4,41
Preferred didactics	Mixed teaching	3,71
<i>Nationality</i>	<i>Not Italian</i>	3,69
DL requires more effort	Yes	3,56
<i>Composition of family unit</i>	<i>Absent parents – one parent present/no siblings</i>	2,69
<i>Quality of familial atmosphere</i>	<i>Ambivalent/Negative</i>	2,63
<i>Choice of secondary school</i>	<i>Heterodirected</i>	2,47

Table 4 – Fourth Group (19.5%): Consensual opportunists

<i>Variable Label</i>	<i>Significantly associated modality</i>	<i>Test-value</i>
DL is more tedious	No	48,60
DL undermines the learning process	No	46,98
DL makes it harder to interact with educators	No	46,65
DL carries greater risk of distraction	No	45,48
DL requires more effort	No	41,31
DL makes it harder to interact with peers	No	32,43
Preferred didactics	Distance Learning	28,58
DL makes time management more challenging	No	26,04
DL increases the study load	No	22,87
DL leads to a decline in performance	No	22,51
<i>Changes in own social life on account of the pandemic</i>	<i>Satisfying in past and present</i>	8,63
<i>Geographical location</i>	<i>South</i>	7,96
<i>Type of institution</i>	<i>Technical institute</i>	6,60
<i>Post-graduation prospects</i>	<i>Employment</i>	6,51
<i>Gender</i>	<i>Male</i>	6,49
<i>Assessment of suitability of available space in the home</i>	<i>Suitable</i>	5,22
<i>Parents' employment situation</i>	<i>Unemployed</i>	3,92
<i>Academic record</i>	<i>Satisfactory</i>	3,85
<i>Type of institution</i>	<i>Vocational</i>	3,77
<i>Choice of secondary school</i>	<i>Heterodirected</i>	3,68
<i>Relational criticalities at school</i>	<i>No issues</i>	3,37
<i>Satisfaction as to free time in the family modality</i>	<i>Satisfied</i>	3,33
<i>Parents' employment situation</i>	<i>One parent unemployed</i>	2,95
<i>Number of electronic devices in the household</i>	<i>None</i>	2,77
<i>Intensity of family life in social and cultural terms</i>	<i>Low</i>	2,55

Distance Learning makes a considerable number of students feel “deprived of quality relationships” (evidently perceived as only possible in person – particularly profile 2), with teachers and peers, regardless of their often outstanding academic records. The problem of “access” to the Internet and to technology and / or the issue of inadequate spaces for study and leisure within one’s home, when present, exacerbate every other identified criticality. In addition, although most residences are equipped with computerized devices and an Internet connection, schools seem to be rather lacking in this regard; the IT skills required in this context (DL is more demanding in this regard), moreover, betray a considerable gap, which likely affects students as much as teachers.

In a nutshell, on the one hand, those “already” fragile individuals with uncertain academic plans that predated the pandemic – foreign students, from low social backgrounds, with limited technological skills, etc. – are, hypothetically, at greater risk of dropping out of school and experiencing multiple forms of social exclusion. On the other hand, for weaker and less motivated pupils, DL seems to assume the form of *a way out*; in other words, those subjects most *eager to leave school* – deeming it an inconvenience – and glide into the world of work, experience discomfort in less problematic and antagonistic ways. In light of this, however, there seems to be a disadvantage for those students who are evidently more critical and cognizant of the consequences, both short and long-term, of DL (profile 2) – and are characterized by a strong connection to school (in terms of values, content, experiences and actors involved) – and are now essentially forced to tolerate the form that teaching has taken on throughout the pandemic.

Academic institutions could invest more on their technological accoutrements, focus on the expansion and strengthening of specific skills (of students and teachers) and on the articulation-reformulation-advancement of objectives, using the emergency phase as an opportunity to reduce the gaps that have surfaced. All this, taking into account that the data have revealed the existence of a large community that have *entered the logic of remote learning “with cameras and microphones switched off”*; a cluster with a *passive and inattentive presence set against maximum performance*, which, as it were, aims to secure a pass to the world of work, quickly and without too much effort, maybe even without any real, key skills.

Contemporaneously, the demand for a more substantial *dialogue between schools and families* becomes apparent, as well as the need for schools to monitor *the relational and interactional aspects*, broadly speaking (in the context of the classroom, but also, insofar as possible, within the domestic sphere): in the presence of critical issues on these fronts, in a context like

that of the pandemic, the students' course of personal, cultural and social growth may come to be profoundly compromised¹⁴.

Having bridged some of the classic gaps, with a specific focus on the unfolding and highly insidious dynamics, having made a targeted and technologically coherent investment – which does not exclusively comprise the acquisition/assignment, albeit important, of IT devices, the enhancement of internet connections or, even, the mere transfer of input and training content on *e-learning* platforms, but which is also able to constitute a reasoned and profitable investment in terms of skills – the *new faces of academics*, when appropriately combined with in-person teaching, can go from being *obstacles* and *intensifiers of difficulty*, to being a repository of *extensive advantages* and *efficient, transversal solutions*.

5. From DL to Virtual School

The data revealed in our survey perhaps allow one to draw some ideas for reflection that go beyond the more predictable interpretation built around the theme of the digital divide.

Obviously, we in no way wish to deny the existence of the problem. ISTAT, in projecting the 2019 data relating to internet connections available to Italian families, has calculated the number of children between the ages of 6 and 17 who may have had difficulty implementing DL during the lockdown to be 3 million, due precisely to the poor computer-digital equipment of households; predictably, the Institute emphasizes, this deficit opens out in Southern Italy, affecting about 20 percent of school-age children (ISTAT, 2020). These data are in line with those reported in the BES 2020 Report, which shows that “8% of children and youths in schools of all distinctions have been excluded from any form of DL, a percentage that rises to 23% among students with disabilities” (ISTAT, 2021, p. 68).

A similar situation concerns educational institutions. In fact, the pandemic lockdown has led to a *de facto* reversal of the schools' priorities, catapulting into first place, among several needs, precisely those concerning digitization. One might recall that the Recovery Plan in late 2020 had already allocated €19 billion to the Knowledge and Training sector (schools and uni-

¹⁴ Some scholars point out that the overall non-existent effect of the introduction of new technology in schools conceals a combination of positive and negative effects. Falck et al. (2018), in analyzing the TIMMS 2011 database in depth, show how use of computers for studying, searching for material and information, when mediated by an educator can produce positive effects on school performance, while its non-mediated use, or one in no way guided and/or monitored, can have negative repercussions on the quality of the students' work. This evidence can, indirectly, help to explain the greater exposure to the risk of leaving school by the weakest students in Remote Learning programs who are, plausibly, more insecure in the socio-cultural and relational spheres as well.

versities), a part of which was expressly intended for a multiyear FTTH fiber optic installation program for all Italian schools, with a 10% coverage as early as 2021. In January 2021, moreover, the European Commission allocated an additional €325 million to give 12,000 Italian schools, located in areas with insufficient connectivity, Internet access at very high speeds.

There is the issue of digital skills as well, which predominantly affects teachers as the providers of didactic content, less so students, partly on account of their inherent familiarity with ICT. There is no shortage of critical issues on this point. The 2018 OECD *Teaching and Learning International Survey* shows that half of Italian teachers have never benefited from proper specialized training courses on the use of digital technology for educational use, therefore a feeling of personal inadequacy with respect to the adopting the latter is pervasive (OECD, 2020). In this case too, obvious as may be, if one envisions some structured form of recourse to DL, dictated by external or internal needs in the academic domain, one certainly cannot conceive that the actors responsible for this issuance can proceed solely aided by their canonical, disciplinary skills, without the necessary competence to adapt – so to speak – the “old” knowledge to the “new” remote learning platforms.

It could be said that the combination of the action of these three factors, namely (1) the lack of connectivity and devices in the household, (2) the complementary weakness of the connection systems available in schools and, finally, (3) the generally low technical-digital level of teacher competency, compounded by the set of socio-territorial variables associated, with varying significance, would be sufficient to explain most of the results reported above.

However, a more careful reading will reveal, not too surprisingly, an element of discomfort is expressed by students as well, most directly by those earlier labeled “dialectics” who, given the three aforementioned parameters, seem to be in an optimal or near-optimal position for implementation of DL programs.

As is well known, the videoconferencing systems through Google Meet, Skype and Zoom along with modular learning environments like Microsoft Teams or Google Classroom, as well as messaging systems the likes of WhatsApp, have been the most utilized technological solutions for carrying out remote learning activities in schools (see, for example, Mascheroni et. al., 2021). Granted that these tools are also very valid and effective for the remote transmission of some cognitive content that can be effectively transmitted, this begs the question: how much of what we call “the school experience”, or even, more simply, “going to school”, are platforms of this type able to reproduce? This is not so much a reference to the debated, yet indispensable function of the evaluation of learning, certainly made more

complex and, in many ways, less reliable by remote frameworks, but rather to the essentially social nature of “attending school”.

Clearly, this is not the place to reflect on the issues of the classroom community, peer interactions, or the relationship between students and their teacher-guardians; nor is it the case to disagree on what could be considered the identity trait of the school experience, i.e. the constitution of learning processes for the obtainment of academic-curricular knowledge, within a process of social order wherein fundamental socio-relational skills are acquired, both for academic life itself, and for the young students’ futures. This paper will be taking for granted the more than consolidated findings of the sociology and psychology of education, as well as pedagogy, on these issues.

What can be undeniably stated is that DL, even when delivered at optimal levels of connectivity and digital adeptness of teachers, has not only led to a – by no means painless – severance of these two processes, which in the realm of “schooling” are inextricably connected, but has in fact prejudiced the regular implementation of social processuality, which represents an authentic belt drive for curricular knowledge. This figure is markedly reported in graph 2, above, which shows that roughly 2/3 and 3/4 of the student respondents declared that DL has caused a decline in their relations with teachers and interactions with peers, respectively.

In focusing specifically on a potential reduction of this serious vulnus, one must reflect on alternatives to DL. In a high-tech scenario, it would be possible to reason in terms of virtual reality (VR). The leap is certainly huge, considering that in recent Italian experience DL has in fact at best represented the mere transference of the traditional classroom lecture into a relatively poor digital environment, with the real risk of reducing “school” to little more than individual MOOC-style training (see Head, 2014).

Thinking in terms of VR means a clear paradigm shift, in short, nothing commensurable to videoconferencing: “In technical terms, VR is an artificial three-dimensional environment created by a computer and presented to a person in an interactive way. It refers to the computer simulation displaying an environment through which one can walk and interact with objects and simulated computer-generated people (avatars). Virtual environment is usually three-dimensional, and it often attempts to replicate the real world in its appearance and physical phenomena. It simulates the user’s physical presence in an artificially generated world that allows interacting with the environment” (Kamińska et al., 2019, p. 2; see also Burdea & Coiffet, 2003; Steinicke, 2016). Normally, one accesses VR with an HDM (Head-Mounted Display) device, specially equipped with an integrated display and lenses, which allows for three-dimensional vision; the HDM is worn by the user and allows them to immerse themselves completely and directly, and thus dynamically experience a virtual environment from within, wherein, more-

over, they can move as if in a real physical space, as well as interact with objects and people that share that same space. The broad-spectrum sensory reactions (visual, auditory, but also tactile, olfactory, gustatory) that this type of experience can provoke, prompted Burdea & Coiffet (2003) to talk about VR in terms of the technology of three Is (Immersion, Interaction, Imagination).

However, the point we are primarily concerned with is not replacing classroom lectures with VR lectures. Much literature exists on this issue, and reporting it here would be of little import. However, we can refer the reader to an interesting work of systematic review, carried out by Kavanagh et. al (2017) on 99 papers selected from an initial collection of 379 publications discussing the application of VR software to the field of education. In said work, the authors focus, among other aspects, on the disciplines for VR application (especially medicine, engineering, astronomy, physics, computer science), on its limits in terms of technology (high costs, software functionality, improvement of VR reproduction), the residual effects of physiological reactions such as motion sickness, on the placement of students involved (in most cases in higher education), on the widespread absence of pedagogical groundwork in training experiences. In contemplating its effects on learning, it would seem, by and large, that VR is usually able to “lead to increased student engagement; provide active, constructivist learning; increase frequency of authentic learning experiences; allow for empathetic experiences; enable students to exercise creativity; and provide an arena for visualising abstract concepts concretely” (Hu-Au & Lee, 2017, p. 216).

In our case, the application of VR is hypothesized not so much to feature the structure of the atom, in the context of a physics lesson, or a room at the Louvre, in the context of an art history lesson, or the brain in a science lesson. The object-environment to be reproduced through VR would be the actual classroom, which would be generated in a virtual but integral way (desks, chairs, blackboards, any other teaching supports, etc.) and populated by the avatars of students and teachers, who, by the very nature of the three fundamental functions of VR (immersion, interaction, imagination), move, act and interact in ways and dynamics typical – to the greatest possible extent – of authentic school life in all its forms. Resorting to this technology, in such a way as to imply high levels of not only cognitive, but most importantly, socio-emotional engagement and commitment, would be fundamentally and primarily aimed, as previously stated, at reducing the domestic confinement of students in lockdown as much as possible; a condition they could choose to handle, as has happened and as our data attest, by implementing practices that distract from DL (cameras off, simultaneous ongoing chats, carrying out other activities at the same time, etc.), thus significantly reducing its impact. Subsequently, there would be the matter of understand-

ing what forms of content delivery a virtual school environment, recreated in this fashion, could lend itself to, envisioning an evolution towards a dual application of VR – to the physical space of the classroom, as well as to the object-topic of the lesson.

Without imposing upon the allocated space, we can conclude by hoping to see wider experimentation in this direction, in full awareness of the magnitude of the problems mentioned above, particularly those relating to the operating costs of VR, which are still too high. In addition, one should consider the tolerance users eventually build up, as mentioned also by Kavanagh et. al. (ibid.), which could reduce the impact of VR in terms of motivation. Last, but not least, careful consideration is needed regarding the fact that current HMD designs are hardly suitable for prolonged use over time, for many hours a day over many days, without the very likely presentation of further consequences, potentially more serious than those comparable to motion sickness.

There is, however, another side of the coin, in a manner of speaking. It is no mystery that the field of VR is in rapid evolution, thanks to the vitality of leading companies in that field, such as HTC, Valve, Oculus, Google, Sony even. Noteworthy is the 2014 acquisition by the most famous social network in the world, Facebook – already in possession of Instagram and WhatsApp – of Oculus, an active start-up in the area of VR technology and HMD production. In October 2021, Zuckerberg founded Meta Platforms Inc., a multinational company that controls the aforementioned companies. An interview dated March 2021, given by the founder of Meta Platforms Inc. to *The Information* a few months before the creation of the company – as well as the press release and the customary letter signed by the founder himself at the time of establishment – clearly state some basic principles constituting the mission of Meta, on which it seems fitting to dwell briefly.

First off, the company name. Meta is a contraction of *Metaverso*, an explicit reference to Neal Stephenson's 1992 book, *Snow Crash*, in which *Metaverso* represents a virtual world parallel to the real world; the plot is entirely built on the interaction and interpenetration between the two worlds, within a narrative logic that develops according to the mystery genre and is structured around the category, one might say, of *Meta a priori* (*Metaverso*, *Metavirus*, *Metalanguage*). The main purpose of Meta Platforms Inc. remains that of connecting people, but this will take place using a completely new platform compared to Facebook, i.e. *Metaverso*, which maximizes the sense of one's own presence as well as the presence of others: "The next platform will be even more immersive – an embodied internet where you're in the experience, not just looking at it. We call this the *metaverse*, and it will touch every product we build". As for the purposes of social connection, there seems to be no limit to the imagination: "In the *metaverse*, you'll be

able to do almost anything you can imagine – get together with friends and family, work, learn, play, shop, create – as well as completely new experiences that don't really fit how we think about computers or phones today". Concretely, in a future that does not seem to be too distant "you will be able to teleport instantly as a hologram to be at the office without a commute, at a concert with friends, or in your parents' living room to catch up. This will open up more opportunity no matter where you live. You'll be able to spend more time on what matters to you, cut down time in traffic, and reduce your carbon footprint". The inconvenience of wearing HMDs seems to be a transitory hindrance, with Zuckerberg predicting the upcoming advent of equally powerful but much more wearable glasses, very similar to regular spectacles, connected to a computer capable of executing the necessary processing for the implementation of VR.

Meta seems to be a product of its time, a direct response to the Covid-19 pandemic and its social distancing effects. Regardless, it presents itself as a formidable and environmentally sustainable instrument of social inclusion, providing one hefty condition, that all the problems of digital divide be overcome. In short, although risk is the element around which our society is structured (Beck, 1986; tr. it. 2000), we need not anticipate a catastrophic society to appreciate the benefits of VR. Return to the subject of school, it should be recalled that, in our country, Legislative Decree no. 179 of 18/10/2012, provided for the establishment of Digital School Centers (CSD), designed precisely to support the needs of schools and students located on the islands or in inland mountain areas, with physical attendance problems due to atmospheric phenomena capable of impeding regular school days. This same need to promote the social inclusion of geographically isolated schools and students through digital technology resources also drives the movement of *Avanguardia educativa* (Educational avant-garde) (2014) and even more so *Il Manifesto delle piccole scuole* (The small school Manifesto) (2017) promoted by Indire (National Institute of Documentation, Innovation and Educational Research).

To sum up, any effective action aimed at testing out digital classrooms by way of VR technology must necessarily adopt a perspective of multidisciplinary collaboration, one capable of combining the knowledge of computer scientists and mathematicians with that of pedagogists, sociologists and educational psychologists¹⁵. Only this will avoid forms of technological virtuosity as an end to itself – of little use and potentially dangerous – and make digitization a credible response to the concrete needs of both students and teachers.

¹⁵ In the coming weeks, a project to test a prototype for a virtual classroom will be launched at the Digilab of Sapienza University of Rome

In concluding this work, one cannot fail to underline a couple of aspects regarding the consequences, from an ethical standpoint as well, of the conducted investigation and the experiments contemplated herein.

The results of this and other surveys on DL warrant, by way of an institutional centralization strategy, accurate surveying, systemization and appropriate valuation, by virtue of promotion and advocacy campaigns, directed primarily at schools (teachers and students) and families, but also to businesses operating in the field of digital platforms designated to DL. All this in view of an increased awareness and more careful monitoring of all actors involved in DL, and of the mechanisms that may lead to the surfaced adversities.

Another aspect, conversely, concerns the need for utmost consideration of the effects of the desirable VR-based DL experimentation. As mentioned, VR experiences imply very high levels of sensory, cognitive, emotional and, not less critically, physical engagement, especially when activities - as it is for DL - present as prolonged and systematic. Needless to say, this will not merely entail the possible effects of tolerance building in the wake of very promising initial results, critical to the enquiry.

It will also, and most importantly, be necessary to monitor its effects on human health, in terms of any number of physio-psycho-sensory disorders resulting from the extended use of VR technologies and devices.

Ideally, one may surmise that the scale of such disorders could slide back as a result of future technological developments aimed at maximally reducing, but not eliminating, the distance between the real and the virtual.

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