Schools as Cultural Reproduction Devices

Frankie T. K. Fong[1,2,#], Alejandro Erut[1,#]
and
Cristine H. Legare [1,*]

[1]Department of Psychology, The University of Texas at Austin
[1]Center for Applied Cognitive Science, The University of Texas at Austin
[1]Early Cognitive Development Centre, School of Psychology, The University of Queensland, Australia

#Joint first authors

*Corresponding Author:
Cristine H. Legare
legare@austin.utexas.edu

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Abstract
A prevailing view of education is that schools are designed to teach academic content knowledge. Schools are thus predominantly studied in the context of content mastery, and rarely from a cultural evolutionary perspective. We propose that schools should be studied as devices of cultural reproduction, that foster cultural contact, transmission, and change, where children acquire specific cultural adaptations reproduced to fulfill respective ecological demands. We use historical examples to illustrate how schools support cultural stability, and how they serve as the point of contact to deliver contents that may lead to gains as well as losses. These are elaborated in the context of cultural reproductions of knowledge and skills, as well as values and identities. Lastly, we raise important questions about the suitability of most traditional schools in satisfying current global changes and cultural demands.

Keywords: Education, schools, cultural demand, cultural reproduction, cultural contact, cultural transmission, cultural change, cultural loss

1. Introduction

Imagine comparing an ultra-high-definition photograph on the front page of the latest edition of National Geographic magazine to the first picture ever taken by Nicéphore Niepce in 1826 titled a "*View from the*

Window at Le Gras". Picture the quality of Niepce's photograph (taken with a camera obscura), the landscape of the Saint-Loup-de-Varennes of that time through the author's window, and the pale black, dirty grey, and old whites of the piece. If you put one photograph next to the other, you would notice the difference between two stages in the development of a particular photographic technology: the camera. This gap reflects the drastic changes in the way people capture images, the tool or device they use, with whom and through what medium they share information, as well as the cost, frequency, and speed of carrying out relevant tasks. This photography and camera example illustrates a core feature of human cumulative culture -- the gradual accumulation of inheritable knowledge and continued improvements of technologies and processes over generations, that no lone individual would be able to devise on their own regardless of their capabilities (Chudek et al., 2016; Tennie et al., 2009). Critically, it involves cultural adaptation where novel cultural variants are integrated into a group's behavioral repertoire to suit changing ecologies (Boyd and Richerson, 1985; Pagel and Mace, 2004), by either generating new behaviors or modifying existing behaviors (Mesoudi and Thornton, 2018; Rawlings and Legare, 2021).

From the invention of the first stone tools to the development of technologies that allow for near-instant video communication around the globe, the genus homo, and particularly humans have shown an extraordinary capacity to reproduce, transform, and accumulate cultural information within and between generations (Legare, 2017; 2019; Legare and Nielsen, 2015). As a species with complex cultural behaviors and sophisticated artifacts, humans have evolved to socially transmit an enormous amount of knowledge that range from extractive and foraging techniques that allow the maximization of returns, to norms that shape how community members share this return to have a solid buffer during periods of scarcity (Boyd, Richerson and Henrich, 2011; Henrich and McElreath, 2003; Tomasello, 2016). However, this is not a simple process, as the acquisition of knowledge and norms that an adult needs to be proficient and requires a long learning period. For instance, within the societies in which hunting is still a frequent practice, the maximum return for a male is reached around age 35 years (Kaplan et al., 2000). This indicates that it is not physical maturity, endurance, or strength (all of which occur earlier in development), but knowledge (e.g., information about prey's behavior that leads to efficient tracking) that determines the return. Hunting knowledge and techniques are the results of cultural developments that were refined and transmitted over generations. In this sense, human knowledge is the result of a vast repertoire of symbolic and behavioral variability that takes place within and between populations (Haun, 2015; Barrett, 2015), and which was shaped by adaptations over generations in correspondence to diverse ecological and cultural demands (e.g., the specific problem that the cultural device was supposed to solve).

Humans grow up in environments that are constituted by cultural representations (e.g., beliefs, rituals, customs) associated with values (e.g., emotions, moral standards) and identities (e.g., gender, ethnicity, nationality), inherited and modified over generations (Boyd and Richerdson, 1985; Sperber, 1985). Therefore, to become competent cultural members of their communities, children must acquire a vast amount of physical, social, and cognitive skills as adaptations that fulfill cultural and ecological demands (Bjorklund 2020; Bjorklund and Pellegrini, 2000). Our prolonged childhood and juvenile periods allow us to fully develop knowledge and skills that are highly variable and complex, in terms of their format showing cognitive capacities unmatched by other species (Bogin, 1990; Dean et al, 2014; Konner 2010; Nielsen, 2012; Pagel and Mace 2004). As individuals develop, from whom, where, and how do they primarily acquire cultural contents? We propose that schools are evolved (selected) cultural devices that fulfill the function of

reproducing and transmitting cultural representations in the form of knowledge, skills, values, and identities (Gurven et al. 2017; Legare, 2017; 2019; Pinker 2010; Ritchie and Tucker-Drob 2018).

A prevailing traditional view of schooling is that they are institutions where students learned with comprehension, communicate (listen and speak) effectively, and write with clarity, based on instructions delivered by teachers. This is presumably due to mastery of language being crucial for forming social bonds and subsequently acquiring, exchanging, and documenting important knowledge (including science and mathematics) and cultural information (e.g., norms, moral standards) (Vincent, 2019). This view of "following instructions to gain knowledge" is broadly consistent with and reflected via the definition of "education" or "schools" in any English dictionary. However, individuals from other cultural groups may have different views of the role of schools. For example, in Spanish *educación* refers to the instillation of respectful behaviors and unity, and in many Asian languages similar views are shared, where education is also treated as means of transmitting "thinking" across generations. Schools also shape students' normative behaviors, values, beliefs, and identities, but how schools and teachers do this remains understudied from a cultural evolutionary perspective. Educational research has predominantly focused on academic or career outcomes in the context of content mastery and qualifications (Wellington, 2015).

Indeed, from a cultural evolutionary perspective, schools are devices suited (selected) to reproduce certain contents (e.g., literacy) but not others (e.g., hunting techniques). And their curricula are designed to fulfill cultural demands. We argue that schools are the institutional reification of cultural attractors à what LevVine et al. might call population-level patterns (LevVine et al., 1994). Cultural attractors are theoretical constructs that are used to describe and explain how and why mental and public representations result from chains of systematic transformations. Additionally, they explain the stability and distribution of these transformations and representations over time (Buskell, 2017; Sperber, 1996; Claidièr et al., 2014). In other words, schools are cultural devices where children, adolescents, and adults gain proficiency in those aspects of their lives that are culturally relevant (e.g., industrial workforce) (Vincent, 2019).

In many societies schooling is viewed as a "natural", mandatory, part of child development. Schools play a formative role in organizing children's learning interests and milestones (e.g., acquiring certain levels of knowledge and skills) required for cultural "maturity" (Rogoff et al., 2005). Although this may limit children's individual learning opportunities (e.g., by observing and involving in personal activities within their families), it enhances the structure and stability of cultural contents that are being reproduced to suit the demands of the bigger environment or the whole cultural group. For example, even within the same nation, children from different families may practice varying conventions of chores but learning to do the same chores at schools will enhance uniformity and minimize conflicts. Thus, to understand why humans have schools, besides their "need" for knowledge, it is necessary to describe the evolved function for which schools were selected.

Analogously to photography and camera technology, schools illustrate the uniquely human capacity for reproductive, transformative, and cumulative knowledge (Boyd and Richerson, 1985; Henrich, 2015; Muthukrishna and Henrich, 2016). We propose that schools are cultural devices, presented as forms of institutions, used to induce cultural reproductions by establishing contacts (i.e., relationships between different agents), transmitting a large body of information, and transforming people's ideations. Still, different than photography and camera, where improvements are driven or controlled mostly by

technological factors, schools are the institutional locus in which cultural contact, transmission, and change occur. That is, cultural reproduction is not a contingent effect of schools, but a function they serve intrinsically; they are dedicated institutional, artifactual devices to that end.

In the next section, we will focus on how schools function as stable cultural reproduction devices based on factors of how schools were set up and run. We will discuss the three inter-related components of cultural contact, transmission, and change, which underly the process of cultural reproduction at schools. This will be followed by further discussion of cultural reproduction in the context of knowledge and skills, as well as values and identities. Lastly, we will highlight challenges that new technology, globalization, and new connectivity posit to schools, at least in their most traditional version.

2. Schools as Devices of Cultural Contact, Transmission, and Change

We contend that schools serve as devices for cultural reproduction. Three key processes are essential to address the role of schools as culturally evolved devices. They should be viewed as inter-related processes of cultural reproduction.

The first process is cultural contact, which can be represented by two individuals A and B, or two groups at a population level (e.g., actors of culture A vs actors of culture B). Contact is a necessary step for cumulative cultural knowledge creation and transmission, where individuals connect with and influence each other. From an evolutionary standpoint, behaviors can be based on relationships of different kinds. For instance, individuals (or groups) can cooperate (e.g., by reciprocal or mutualistic activities), or they can establish relationships of exploitation. In the first case, the cost and the benefits of the behavior are shared; in the second, one agent or group pays the cost while the other get the benefits. Cultural selection, as one of the possible outcomes of cultural reproduction, emerges from the relationship between cultural demands and the symbolic (e.g., ideational, representational) and behavioral solutions that the actors implement -- based on cooperative or exploitative relationships. While cooperative strategies lead to culturally a favorable stable solution for both parties, exploitation imposes a higher cost on the exploited ones. For example, the spread of modern schools as a cultural model is related to instances of cooperation and instances of exploitation at different levels. While native teachers might cooperate with their students by keeping the native language alive, colonizers fostered a schooling system that generated cultural loss, exploitation, and servitude.

The second process is cultural transmission. After cultural contact is achieved, ideational and behavioral pieces of information need to be transmitted to new individuals or groups (e.g., next generations) to become culturally relevant. The process of transmission is highly complex and was described by two main theoretical approaches (Buskell, 2017). On the one hand, some authors describe cultural transmission based on a replication process mediated by high fidelity imitation and cognitive biases (e.g., conformism). On the other hand, some explanations consider that cultural evolution is not replicative but reconstructive (Scott-Phillips, 2017). This last approach includes patterns shaped not just by the characteristics of the cognitive machinery (e.g., biased reasoning) but also by the patterns of reconstruction and the weight of a subset of representations that is highly widespread (e.g., traditions) in a specific cultural niche (Sperber, 1996). For instance, the expansion of the Ecuadorian state over the Amazon was delegated to the missionaries until the early decades of the 20th century (Martínez Sastre, 2016). And even when the local languages were

mastered by the religious authorities, the religious conversion, regimented routines, and the study of Spanish were compulsive for the pupils.

The third process is represented by the fact that cultural reproduction devices may also lead to cultural change through selection (which is also dependent on the type of relationship established through contact: cooperative vs exploitative). The concept of cultural selection, a necessary component of cultural evolution, implies that not all cultural devices are equally advantageous given the specificities of the cultural demands. Additionally, cultural demands are also shaped by relations of power (the actor's position in the social structure through prestige or dominance, the distribution of resources, etc.), and what is beneficial for one individual or group could be maladaptive (e.g., too costly) for others. In other words, once a cultural representation is distributed in a population, it can generate a change that can be a) beneficial for the individual that incorporates it, or b) for the individual that exploits its benefit by imposing (by persuasion or enforcement) the representation on others. Cultural change is often not positive (e.g., fitness-enhancing) for all the parties involved, as it can also lead to maladaptation, especially in circumstances of exploitation (Henrich, 2004). This last point is central to go deeper into the historical circumstances that led schools to spread as "successful" cultural transmission devices. In this sense, there is no doubt that most schools in previously colonized countries were introduced as part of the colonial strategy, and among its consequences, one can find a myriad of examples of cultural loss and exploitation. It was also shown by historians of colonial education that the expansion of the modern model of schooling has been grounded on the asymmetrical relationship in the distribution of power between colonizers and colonized (Madeira and Correia, 2019).

3. Schools, Cultural Demands, and Cultural Stability

Evolutionary adaptation in cultural evolution shows similarities with biological evolution since both are characterized by cross-individual variations, heritability of variations, and whether variations are retained or spread (Creanza, Kolodny, and Feldman, 2017). However, cultural contents may be transmitted horizontally and are not limited only to the vertical transmission from parents to offspring (Chudek, Muthukrishna and Henrich, 2011; Moya, Boyd, and Henrich, 2015). Furthermore, cultural variants do not rely on biological means of reproduction, but through the inferential process of social learning, by which cultural learners use others' behavior, testimony, and guidance to draw inferences about their cultural environments.

We argue that schools have emerged as a stable device used for cultural transmission on a global scale. Schools played (and play) an essential role in the process by which humans modify the environment and their stock of representations as a response to different cultural demands. This role is particular in the sense that it presents both the cultural requirements to be solved and the repertoire of knowledge and skills necessary to address them. But different demands require different toolsets. A clear example is illustrated by the conventions of different musical genres and the set of skills that they elicit. While a classical musician's training implies hours and hours of repetition of the notations written in the score (e.g., harmony, articulations, rhythmic figures), a jazz musician employs those hours in improvising (creating) inside the broad boundaries of a simplified score. The two music styles activate and access different cognitive toolkits and resources to satisfy different demands. Similarly, schools across diverse populations have to make adjustments according to local demands to serve as a stable cultural transmission device. There are many

examples of this when we look closer at how schools seem to have generally met the following four key factors that contribute to the maintenance of cultural stability (Claidière and Sperber, 2010):

a) *Ecological availability*. Schools are tailored carefully by local authorities based on ecological circumstances to suit local demands. For example, many school systems around the globe implement bilingual education (Baker, 2010). In addition to the national language, they often encourage mastery of either a mother tongue, a second language (other than the mother tongue but commonly used in the community), or a widely used foreign language (e.g., English), depending on various purposes (e.g., better job opportunities, preserving native culture).

b) *Reward-based factors*. At an individual level, one of the positive outcomes of schools is related to examples in which solarization led to upward social mobility. An example of that is the establishment of universal, public, and free education in some South American countries during the late 19th and early 20th centuries. At a group level, the expansion of traditional forms of schooling was used by postcolonial governments to consolidate national identities to uphold a sovereign political agenda (Madeira and Correia, 2019).

c) *Content-based factors*. Educational contents and curricula are designed and delivered according to students' psychological disposition, to maximize their learning capacity. School curricula (at least across Western societies) are inspired and guided by Jean Piaget's theorizing of children's cognitive developmental stages, whereby classroom activities and assessments of different levels are organized according to respective developmental milestones (Brainerd, 2003). Another common influence among Western schools is Vygotsky's "zone of proximal development", where children in this "zone" will learn from more capable others (e.g., teachers) to pursue tasks or activities that are not too easy but difficult enough for them to complete under guidance (Davydov and Kerr, 1995; Hausfather, 1996). Similarly, with increasing awareness of education equality issues, certain authorities have started revising their policies and curricula to suit indigenous populations, so that they can also learn as effectively as other ethnic groups within the same nation (e.g., Bang et al., 2010; Marin and Bang, 2015).

d) *Source-based factors*. The information delivered and target outcome in most schools are standardized and being approved by certain authorities. Schools may likely be perceived as credible sources that deliver reliable cultural content (including knowledge, values, norms) along with teaching aids. For example, textbooks and other learning aids help children to acquire fundamental knowledge and skills (e.g., reading and writing) to function and solve problems within their physical living and social environments. Another example is that schools in Malaysia provide resources for moral education, which is intended to shape children's moral standards and prosocial behaviors (Balakrishnan, 2010).

Schools often employ stable transmission mechanisms. Rote learning constitutes the main strategy around which most traditional schools were pedagogically configurated (Anderson-Levitt, 2005; Moore, 2010). It involves memorization of materials, re-enaction of modeled behaviors or performances, and repetitive rehearsals, all guided strictly by the teachers. Besides the efficiency trade-offs associated with rapid mass transmission of contents, we argue that one neglected factor is that rote learning seems to require less cognitive resources (probably for both acquisition and transmission) in the context of social ecology in which cultural attractors (e.g., being competitive in a job market that requires high-fidelity imitation and a submissive attitude toward local authorities) pulls against the emergence of creativity and innovation. Once

stabilized, cultural strategies (e.g., norms, rituals) can solidify the transformative process of ideational variants in a direction which is shared across actors in a specific population. Therefore, high-fidelity transmission could be initially triggered by historical events that reify its gravity in schools after the colonial period and still shape cultural strategies of learning and teaching in most schools, even when they are settled in different social contexts.

Though schools are established as cultural stabilization devices, their individual process of contact-transmission-change is highly context-dependent. Although school systems across certain populations may appear to look similar (with standardized curricula and exam systems, e.g., the General Certificate of Education system in the UK and various commonwealth countries), what and how students learn should vary according to local ecological and cultural demands. Indeed, any evolutionary approach to schools should thus take into account the historical conditions in which schools globally developed, the social actors involved, and its function as a cultural device. Importantly, the fact that humans developed schools and that schools were culturally selected as stable transmission devices that fulfill cultural demands, does not imply that the effect of schools is always beneficial for all the parties involved (Henrich, 2004). Instead, many examples of the introduction and maintenance of schools indicate that they resulted from conditions of exploitation that lead to cultural loss.

4. Cultural reproduction of knowledge and skills

Schools are sites where cultural contact, transmission and, change take place. These three processes have an impact on the way students include new knowledge and skills to the cultural repertoire that makes them proficient in ways that satisfy cultural demands. Students have the opportunity to interact with people who possess diverse knowledge and skillsets in schools. The enabling process that results from cultural contact can sometimes be beneficial, but can also lead to cultural replacements that are costly for the parties involved. During the colonial period, for instance, in Asia, America, Middle-East, Oceania, and Africa, schools were used to impose exogenous cultural content upon native (colonized) populations (Espinoza, 2019; Madeira and Correia, 2019; Kallaway, 2019; VanderVen, 2019; Morrison, 2019). The type of knowledge and skills that emerged from the colonial contact enforced systems of knowledge and practices that relate to an external model of cultural reproduction, as well as foreign cultural contents in terms of demands and responses. As a result of that enterprise, local knowledge and skills were substituted by European ones, but not always for the benefit of the local populations. The teaching and learning of new skills (e.g., speaking a new language like Spanish, French, Portuguese, or English) was exploited to the benefit of those who can control the workflow and a new critical mass of "qualified" workers (Vincent, 2019). This process was similar during the transition from a rural to an urban/industrial economy that Europe and the US experienced internally (Gramson 2019).

In addition, schools are the space in which endogenous and exogenous types of knowledge and skills are transmitted vertically (e.g., adults to children) and horizontally (e.g., by peers). Some positive examples of how knowledge and skills are transmitted through education as well come from the development of national systems of education mainly in postcolonial states in Asia, Middle-East, Africa, and America (Madeira and Correia, 2019; Freaser and Moore, 2019). Those systems fulfilled the function of democratizing the access to literacy and the construction of national identities for the newly independent countries. A similar process took place in Europe during the secularization of the state (e.g., post-revolutionary France). An additional

positive outcome of education is that it provides tools that help indigenous populations to have access to sovereignty when it comes to discussing legal issues (Arellano, 2008).

Finally, the acquisition of new cultural content leads frequently to changes in knowledge and skills. A good example comes from literacy and numeracy as probably the two core components of schooling globally. According to historians, the demand for the three Rs (reading, writing, and arithmetic) was a required for being able to navigate a market economy, since it lies behind most economic transactions (Vincent 2019). In the case of literacy, it was required to provide the students with the tools that allow them to succeed in a highly boreoarctic social environment mediated by the state. The new challenge for schools will be to address the type of literacy that the Internet and new technologies currently demand. Moreover, the introduction of subjects that are based on formal science, like biology, physics, chemistry, and even history all have a direct impact by the conflict with intuitive and folk theories – extending the change to deeper cognitive processes and local types of knowledge and beliefs (ojaletho et al. 2017; ojaletho and Medin, 2015; Atran and Medin 2008; Bang and Medin, 2010).

5. Cultural reproduction of values and identities

The development of cultural identity is a process of cultural change, that entails the adoption of cultural norms, beliefs, attitudes, and values of one's cultural ingroup. Gaining literacy skills does not only enable children to acquire knowledge (e.g., geography, science), but also opens up endless avenues for children to acquire values, practices, and behaviors of their cultural group (Ferdman, 1990). Children are like anthropologists, they attend to, engage with, and learn from members of their cultural ingroup, to acquire group-specific information (Harris, 2012; Legare and Harris, 2016), which include values and behavioral repertoire that shape their cultural identity. From time to time, there is a constant influx of new generations entering the community without any pre-established value and behavioral repertoire. Besides, there are also immigrant children entering the community with predispositions that may contradict local cultural values and beliefs. For instance, Latino or Asian children having grown up in families that value conformity, interdependent traits, and prosocial behaviors, may struggle with the US school environment that emphasizes independent academic outcome over socialization (Greenfield et al., 2003). Where the transmission process is likely to be stable and consistent (as discussed in Section 3), schools may yield different cultural change effects on these two categories of young cultural learners depending on the kind of contact formed.

Among different cultural actors, school teachers are those whom children form contacts with and learn directly from. What and how teachers transmit at schools may be based on their beliefs about what a good teacher is and does, as well as their aspirations and attitudes toward child development and education. Teachers may incorporate their life experiences, values, and their culture into their teachings, which form part of the inferences children draw in classrooms to inform their cultural learning (White et al., 2016). During colonial periods, many schools, particularly in non-Western countries were established as part of the missionizing process. The transmission of knowledge (e.g., literacy) was accompanied by insistence on exogenous cultural practices and values of the missionaries, as well as religious beliefs (Rogoff et al, 2005). Notably, whether mission schools taught Protestant or Catholic Christianity, the ideations of behaving, and which language was the formal language of teaching and learning, were largely dependent on the country of the colonizer. This indicates that the values and identities schools wanted children to adopt had to be

consistent with those selected by the colonizers (Morrison, 2019). Relatedly, these schools also provided education to a future leadership class in much of Africa and Latin America, which had a substantial influence on the national values and identities they later enforced (Fraser and Moore, 2019). This process might have undermined local systems of beliefs and values, as they were replaced by exogenous culture. This is an exploitation example of how individuals may change their cultural identity to fit in a new cultural context.

Similar to knowledge and skills, there are instances where positive cultural changes occurred as a result of cooperative cultural contacts established in the interest of local communities. During post-colonial periods, as many countries achieved independence and constructed national education systems, school curricula were revised to include materials that helped to strengthen students understanding of values promoted by the individual national government, which led to national unity (Tormey, 2006). An interesting example is how schools in Singapore encourage the widespread use of "Singlish" (a local version of English that incorporates local habits, dialects, and preferences, without necessarily following ordinary grammatical rules) as it serves as a significant marker of Singaporean national identity (Tong and Cheung, 2011). Another example is how modern schools in San Pedro (in Los Angeles, USA) had induced generational changes in residents' educational and occupational aspirations. The younger generation was more engaged in schooling, hoping to study more, and was more open to a broader range of non-agricultural occupations (Rogoff et al., 2005). Although these are also examples of how individuals adopt new cultural identities in new cultural settings, they both lead to cultural gain instead of loss.

It is important to acknowledge that not all schools are inclined toward promoting a single dominant cultural identity or value. Again, it highly depends on the cultural ecology and demand of a particular population. For example, recognizing the vital role schools play in cultural maintenance, a group of Chinese Malaysian initiated the formation of Chinese Independent Schools (private, secular schools) which not only teach the national language of Malaysia (Bahasa Melayu) and English but also emphasize the learning and practice of Chinese language and cultural practices. Students in these schools tend to display stronger adherence to Chinese values while being a Malaysian citizen, than those who attend ordinary public schools (Siah et al., 2015). In this case, individuals may identify with more than one cultural group or may develop the flexibility to move between different cultural contexts without losing their sense of their main individual identity. This example illustrates how cooperative cultural contacts may lead to positive cultural change of enhancement rather than exploitation.

6. Schools and Current Challenges

Most traditional systems of education were designed and established for a different era and, in consequence, for an outdated set of cultural demands. They were based on a model constructed under religious or colonization influences and socio-economic conditions resulting from the industrial revolution. Given the rapid rate of change linked to the current global reality, it is worth revisiting the extent to which educational institutions are preparing 21st-century learners to face future challenges and building a new citizenry. Are schools reproducing adaptations that suit the current multi-cultural global demands? We identify at least three current changes relevant to cultural learning:

First, the introduction of digital media, widespread accessibility to technological devices, and increasing reliance on digital platforms have changed the degree -in terms of quantity and quality- to which children are exposed to new cultural content. Individuals educated in the traditional system may not be equipped with the critical skills needed to process information from non-traditional platforms. Inequality in the access to new technologies might conduce to inequalities in the type of literacy that they demand.

Second, current workplaces and industries (e.g., IT technology) display high demand for knowledge and skills related to innovation, in comparison to the previous economic environment. A model based on creativity lies behind many startups and the new giants of the economy – which contrast with more traditional fields (e.g., mining, petrol, agriculture) for which innovation was less critical. Particularly, educational practices set up to foster high-fidelity learning of knowledge and skills may not be preparing students who can habitually think creatively. In part, the inadequacy of traditional schooling for many new IT jobs is the fact that many tech companies do not require a college degree and that there is a proliferation of online platforms that teach programming-related skills. Additionally, the international division of labor also imposes some constraints on the type of knowledge and skills that are expected from schooling. The famous slogan from Apple "think different" was eloquent in terms of what it is expected from the product in terms of thinking out of the box and being creative, but "designed by Apple in California, assembled in China" talks more about the story of the division of labor. That is, it reflects the differences in educational expectation and cultural demand in each population, in terms of knowledge and skills of the workforce.

Third, along with globalization, there is an increasing amount of cultural exchange. This yields new cultural demands of preparing global citizens who are tolerant to diverse beliefs and worldviews opened to alternative ideations, and display high flexibility. Some schools may have included teaching activities that promote multiculturalism and the development of skills related to this (e.g., collaborative learning, openness to experience), however, traditional schools with strong colonial or religious influence may still be promoting the maintenance of single dominant value and identity.

Nevertheless, whenever there is a point of contact, it induces transmission of information and consequently yields a cultural change of enhancement and/or loss. To ensure efficient cultural adaptations, cultural contact and transmission strategies need to be constantly refreshed, updated, or re-established to suit our fast-changing cultural ecologies and demands. Studying schools as sites of cultural reproduction that involve these processes opens up a plethora of new perspectives and directions to further understand how we evolved as a unique cultural species.

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