

# Disparities in Scientific Literacy: Catch before They Fall

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## Abstract

The report “International Commission on the Futures of Education. 2020. Education in a post-COVID world: Nine ideas for public action. Paris, UNESCO” is used to explore whether scientific literacy is an equity or equality issues because of gender, race and ethnicity, class structure due to family income, schooling, and economic status. The aim of this study is to understand how scientific literacy continues to be an educational issue and can be challenged by three-dimensional model of social justice of Nancy Fraser. According to this secondary research, a trans and interdisciplinary curriculum can help to challenge systemic injustice and redistributing educational resources to economically disadvantaged school may challenge the issues of maldistribution of school facilities. It is mentioned here that gaps of being scientifically literate among individuals can be mitigated by recognizing individuals’ needs according to gender, race. Representation of the contributing individuals especially from the disenfranchised is necessary to address the issues of inequity for establishing the right to become a scientifically literate person. This study may help the teachers to understand their role in the teaching-learning process as leaders and professionals, the students to be the contributors to society and the policymakers to reshape their policies.

## Keywords

Scientific Literacy, Equity or Equality, Three-Dimensional Model of Social Justice of Nancy Fraser International Commission on the Futures of Education. 2020. Education in a Post-COVID World: Nine Ideas for Public Action. Paris, UNESCO

## 1. The Context

In the commission report, UNESCO emphasizes to “...ensure scientific literacy

within the curriculum” (UNESCO, 2020). This is because, along with the outbreak of COVID-19, the COP26 also reminds the anthropogenic involvement with the climate change because of denial to scientific knowledge. It not only reminds the degree of interferences but also targets to protect communities and natural environment by working together. These are explicit concerns that we have been exposed to everyday lives as according to UNESCO (2020) “...we struggle against the denial of scientific knowledge” (UNESCO, 2020). Such situation is further intensified by some more news and information sources. Some of this news sometimes makes us alert whereas others are found to be fake and undependable. UNESCO (2020) mentions what destroying our lives is “...the spread of misinformation and fake news” (UNESCO, 2020) and continues mentioning the urge to “...actively fight misinformation...” (UNESCO, 2020). In line with that, concurrently, Hoq, Toma, and Rahman (2019) studied ten cases of unreliable news and information sources about COVID-19 and how mass people of Bangladesh responded to those. The result is somewhat like the situation mentioned by UNESCO (2020). They found most of the people were less suspicious about the claims of media and reluctant to discuss on the erroneous news to understand the world around them. They were not interested to apply scientific knowledge in making informed decision. In their conclusion, Hoq, Toma, and Rahman (2019) mentioned seven out of ten responses were made without any acceptable scientific explanation meaning a lack of scientific literacy. It is just a micro scenario from Bangladesh but calls for SL as a global commitment (Orozco Fuentes, 2020; Nguyen and Catalan-Matamoros, 2020). The commission report, used as ground for further discussion here, also feared about the supposed outcome of these unreliable news and emphasized on SL to combat those consumption too.

### **1.1. Scientific Literacy**

Before capitalizing SL to combat scientific denial and fight against misinformation, this section describes why SL has been suggested by UNESCO by looking deep into what constitutes SL.

From sociocultural viewpoint, science is not just a content that helps to make sense about the world but embraces the context that explains how people and events are related and interconnected. Snow (2016) perfectly defines SL focusing the ternary function of science as process, product, and institution. Science as a process of knowing the world involves knowledge construction, uses that knowledge as product and leads to a better life as an institution (Snow, 2016). Therefore, providing access to learning science—whether creating or using knowledge—compels to have some level of understanding on the practices and endeavours of science, that is simply the SL. SL is boundless to know some facts and laws or theories of science but is extended to the extent of becoming familiar with the process and practices of science, having capacity to understand the products of science, and get involved in social activity (Liu, 2009; Ajayi, 2018).

Science courses have been found to set a deep root in developing SL (Shaffer, Ferguson and Denaro, 2019). This concept was forwarded more by adding human spirit education in combination with science education (Pei, Cui, and Sun, 2012) and perspective of epistemology and history of childhood (de Oliveira, Simon, and Simon, 2018).

SL is important in this era of globalization because in this changing world, nature of work has been shifting in developing countries in its kind, in the form of requirements and lack of performance of individual (Aikenhead and Orpwood, 2010). This shift has been driven by the need of scientific literacy as these are characterized by knowledge-based society and economy (Aikenhead and Orpwood, 2010).

### **1.2. Scientific Literacy: An Equality of Opportunity or Equity of Opportunity?**

According to the definition above, SL is the educational issue not limited to shape the academic life but to influence the wellbeing of both life and society. On that account, it is important to understand how SL is situated within the context of learning environment. For such, the bottom line of this section is to identify how SL is positioned and whether subject to social justice.

It has already been stated that several international policies of UNSECO, AAAS or NRC have emphasized on SL. It is to be mentioned here that several developing countries have also provided emphasis on SL. To site, the “Comprehensive Review of the Master Plan for ICT in Education (2012-2021), 2019” was published in 2020 in Bangladesh to report the progress of the vision of the National Education policy-2010 (NEP, 2010) to develop a science knowledge-based society irrespective of ages and social class in the country. What’s more is, Egalitarian perspective views science education is essential for social responsibility and claims everyone has right to be scientifically literate, adding the essence of justice issues. Interestingly, another different dimension is set into the issues by critical perspective which reflects the relationship between the power and inequity in scientific literacy and focuses on the social justice issue. To mention here, the differences in the level of SL vary both nationally and internationally (Snow, 2016). For instance, in US the scientific literacy varies according to class structure due to family income, gender even sometimes race and ethnicity. According to National Science Board (2016) the more the families are financially stable the more the SL among them. In 2014, it was found that the male had higher level of SL than female and the numeric value was 69% for male whereas 61% for female (Snow, 2016). Valladares (2021) mentioned the case of less participation of females in STEM subjects. Interestingly, Jordansson and Peterson (2019) mentioned the gender sensitivity is not caused by male domination only but driven by women too. It can be female students found to assault other female students also. Powell and Grubbström (2021) also found the same gender issues are hampering SL. In addition to that, Snow (2016) also informed the varying impact of formal schooling on SL. As schooling is again a subject

that is decided by the class structure and economic status, therefore, the trio—schooling, class structure and economic status—in isolation or combination, expand the disadvantaged group from advantaged to develop and apply SL.

To add more, [Godrum \(2004\)](#) defines scientifically literate person is keen to better understand the surroundings of world. Scientific literacy enables people to participate in discussions on and about the science matter relating to everyday life. Such literacy is important to raise questions posed by others and becoming sceptical. So, it helps people to relate and consider questions to reach to an evidence-based conclusion and select the best option for betterment ([Godrum, 2004](#)). Such definition clearly demonstrates that the focus of science teaching emphasizing memorization of laws and theories has been shifted to such a situation where science must play a basic role for societal change. The role of SL in societal context is threefold according to [Liu \(2009, 2013\)](#). Firstly, SL helps to eliminate the deficiencies of cognitive knowledge among students, to be valuable citizens someday. It helps to correct variety of knowledge and practices without contextualizing the factors like gender, cultural background, or social identity, overall, where it has been inserted ([Mansour and Wegerif, 2013](#)). The assertion of [Mansour and Wegerif \(2013\)](#) means SL provides opportunity to include the disenfranchised group. Therefore, not having opportunities of scientific literacy is an equity issue that demands equity of opportunity and is subject to justice.

In alliance with the first role of preparing valuable citizen, SL is considered to be a commodity that contributes to develop distinct demarcation between scientifically literate and illiterate. This is how the equity issue is emerged in the territory of SL. Achieving the desired level of SL is what according to [Liu \(2009, 2013\)](#) makes “human asset” for lifelong and everyone has right to become human asset. Though sounds like an equality issue but the underlying fact is that how the issues like gender, cultural background or social identity are contributing to expand the gap between the scientifically literate and illiterate group.

Finally, [Liu \(2009, 2013\)](#) mentions SL is an essential tool to contribute to the economy. The explanation is an excellent logic to support how SL is an issue to social justice in the field of education. According to [Liu \(2009, 2013\)](#), SL is a one-way transport to upgrade from a lesser knowledge society to greater. Having said SL contributes to economic development makes an inequity where scientifically literate person is more valued in society in comparison to others who lack SL. It means participation to societal activity and contributing to social decision also makes SL an equity issue.

From the above discussion it seems like equality is not viable. If equality means providing average intervention to all, then equity means providing weighted average of intervention. In case of SL, according to the above discussion, rather than providing the same standard intervention for all, it requires disenfranchised group-wise intervention. Educational studies in the field of social stratification reveal, in one way or other, disadvantage piles up disadvantage over generations resulting self-reinforcing disparities (e.g., [Ladson-Billings, 2006](#); [Delgado and Stefancic, 2012](#)) and perpetuates inequity.

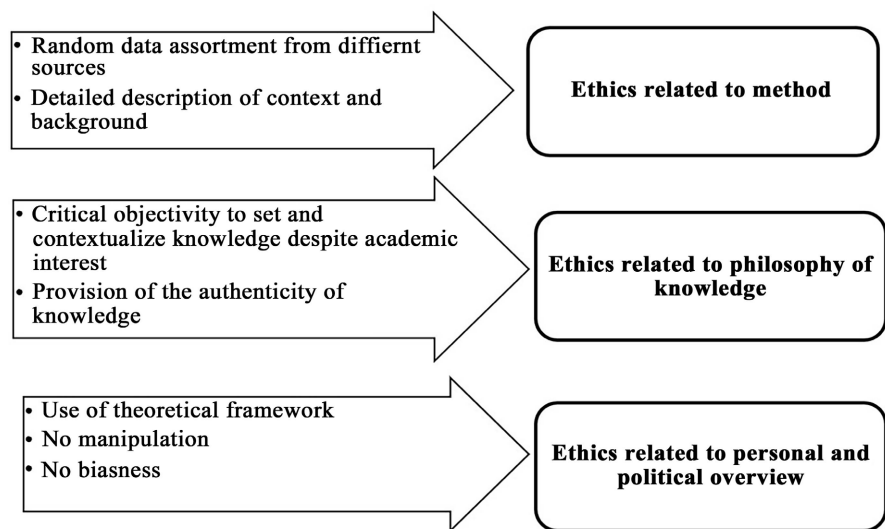
## 2. Methodology

Scientific literacy is the issue that UNESCO (2020) has suggested to revitalize after the outbreak of COVID-19 situation and is expected to reshape the education after this global challenge. Importance of this educational issue was echoed long before by several policies of American Association for the Advancement of Science [AAAS] (1989, 1993), National Research Council (NRC, 1996). All those policies emphasized “Scientific literacy for all”, the term “all” here seeds the equity issues into the topic as question arises how might the heterogeneity be addressed with. The mystery behind the question remains unsolved yet and the aim of this study is to figure out how this educational issue has been perpetuated and further argues how SL can be challenged by the Nancy Fraser’s three-dimensional model of social justice (Fraser, 2005). The report “International Commission on the Futures of Education. 2020. Education in a post-COVID world: Nine ideas for public action. Paris, UNESCO” published in 2020 provides the context for further discussion.

Paradigm like interpretivism or positivism embraces the reality and contextual knowledge and sets the foundation of research based on philosophy (Kuhn, 2015). Primarily positivism holds both scientifically and analytically justified and verified theories (Howell, 2013) for establishing rational conformity between and among rational tools to be used for any study (Ryan, 2018). Here the views and beliefs of the researchers are not considered (Ma and Ma, 2022) and mostly deduction, induction and objectivity are involved (Scotland, 2012). Not relying on theories, interpretivism instead accepts symbolic interaction and conceives the process of consideration of an object by an individual that defines the characteristics of the object (Weber and Henderson, 2012). Hence, the complexity and perception of the relativity of the individual and intersubjectivity is feasible in case of interpretivist (Ma and Ma, 2022). It considers the meaning and understanding of the studies from the social and contextual viewpoint (Ma and Ma, 2022). For the complex perception of individual, the existence of more than the one truth is possible in case of interpretivist approach (Saunders et al., 2012). Interpretivism may assist in finding a possible cause of a policy initiative and the probable impact of it (Regmi, 2019). Regmi (2019) also finds that this kind of approach reviews whether one unit is getting benefitted over another and is involved with the scholarly group in the process of exploring further by the policy. Therefore, it is more appropriate for this study to go with the interpretivism approach. A better exploration on “International Commission on the Futures of Education. 2020. Education in a post-COVID world: Nine ideas for public action. Paris, UNESCO” using by the Nancy Fraser’s three-dimensional model of social justice may have help from this approach. Not accommodating the objectivist view is one limitation of this paradigm (Ma and Ma, 2022). Because unlike positivism, theories of other domains are not generalized by interpretivism but on the contrary, an improved form of understanding of any phenomena with validity gap is aimed for verifying results (Cohen, Manion and

Morrison, 2011).

It is comprehensible that interpretivism puts priority to qualitative analysis from the aforementioned discourse and criticism (Ma and Ma, 2022). Lincoln and Guba (2006) mentioned a suggestion of the selection of data sources randomly to curb the criticism. The validity of the data will be increased by it. Cho and Trent (2006) also propounded that provision of a detailed explanation of the context and background can help to evaluate the transferability and validity of the research to other similar contexts. Therefore, the confirm ability of the research will be increased by providing an explicit and thorough overview of the method (Stromquist, 2000). Accordingly, the ethical standpoint related to this study with the overview of several levels has been shown in the diagram hereinafter.



**Figure 1.** Ethical considerations of the study.

**Figure 1** shows the measures taken to lessen the research bias for this study. However, as secondary research, it is expected not to have any ethical issues and risks here. Secondary research helps developing relationships between the theories and primary data and it develops views other than primary research (Hakim, 1982). Although, context and background unfamiliarity are some of the limitations of secondary research but an advantage for this study, as analysis would focus on several other interests which were not addressed previously in the primary research (Logan, 2020).

### 3. Inclusion and Exclusion Criteria

Following the objectives of the study, a list of potential inclusion and exclusion criteria were developed. It is shown in the following **Table 1**.

#### 3.1. Data Collection

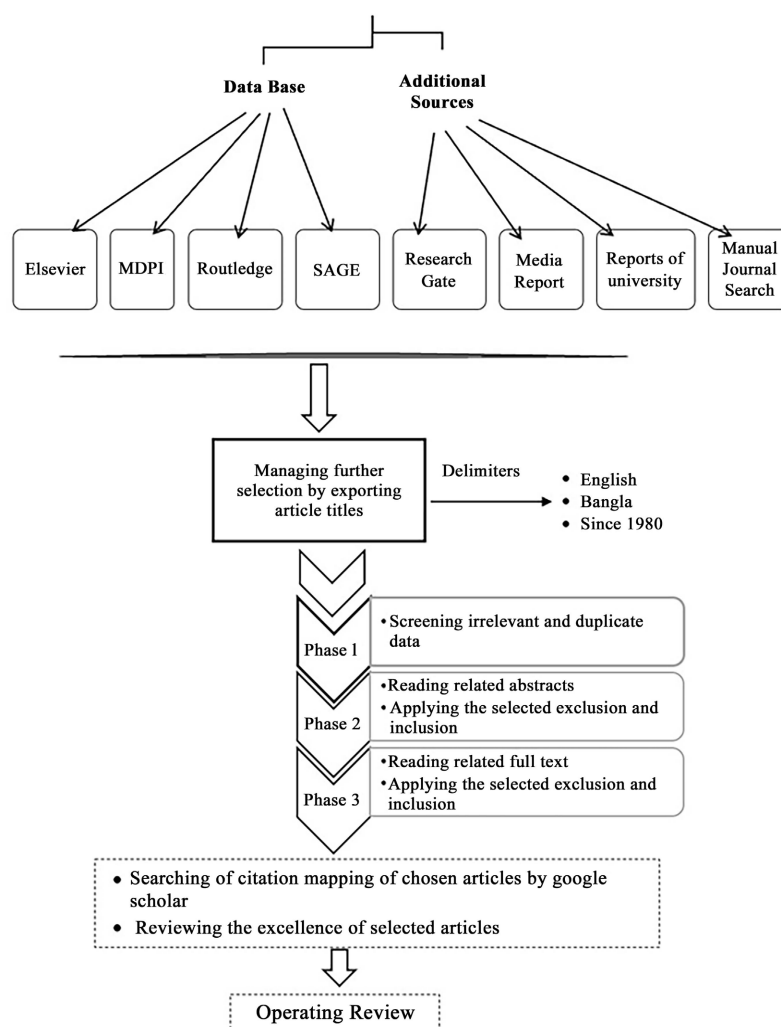
A research was conducted thoroughly during the period of January to April,

**Table 1.** List of potential inclusion and exclusion criteria.

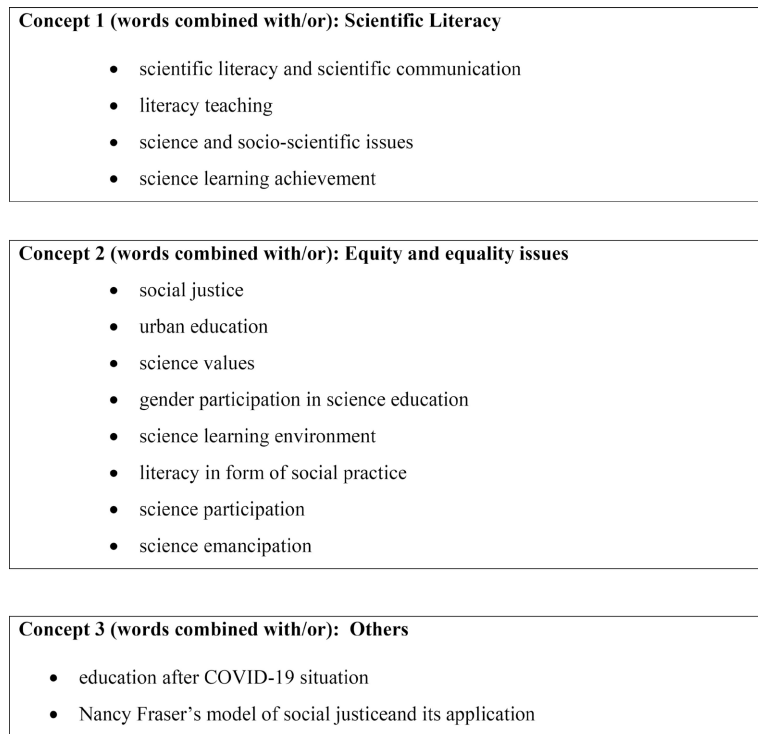
Inclusion criteria	Exclusion criteria
<ul style="list-style-type: none"> <li>• Empirical studies on scientific literacy</li> <li>• Nancy Fraser's three-dimensional model of social justice</li> <li>• Scientific literacy and social justice</li> <li>• Scientific literacy and equity issues</li> <li>• Scientific literacy and equality issues</li> <li>• English and Bangla articles</li> <li>• Studies since 1980</li> </ul>	<ul style="list-style-type: none"> <li>• Empirical studies that do not focus on               <ul style="list-style-type: none"> <li>➤ Scientific literacy and social justice</li> <li>➤ Scientific literacy and equity issues</li> <li>➤ Scientific literacy and equality issues</li> </ul> </li> <li>• Studies not using Nancy Fraser's three-dimensional model of social justice</li> <li>• Studies before 1979</li> <li>• Articles other than Bangla and English</li> </ul>

2024 by using the criteria of inclusion and exclusion. Application of these criteria to hand-search journals, along with different databases was taken place.

The diagram hereinafter shows the procedure of data collection (**Figure 2**).

**Figure 2.** Data collection process.

During the period of January to April, 2024, a number of databases, like, MDPI, Routledge, Elsevier, SAGE had been searched with the combination of the key terms related to this study. Due to the acceptance and relevance of the publication of research especially in social science, these databases were chosen. Composition of the key words used to look for the databases are set down below (Figure 3).



**Figure 3.** Key words of data search.

Searching databases accesses only half of relevant data, although it was thought to offer an ample of relevant literature available (McManus et al., 1998; Haig and Dozier, 2003). Besides, Greenhalgh and Peacock (2005) explained how the process of snowball sampling let one to outreach to 51% of the chosen articles, whereas 30% and 24% come from personal contacts and knowledge accordingly may be offered by the predefined database search. Therefore, in the data collection process, additional sources are considered also.

Initially, hand searching was done for online or printed versions of related articles and journals based on the title. This whole process also used personal knowledge and the steps of search-scoping and conforming for final selection of the journal took place.

The quality assessment of data is the next step. The proposed guide called BEME of Harden et al. (1999) was employed. BEME is a tool consisted of 17 components for analysing the comprehensive quality of the related research articles. There are two columns, one is yes and the other one is no. The greater number of yes in this tool shows the more relevance of it for analysis. If there

was more than the one no in the entire column, it excluded the article for the study. A version of the tool which is modified is given below (**Table 2**).

**Table 2.** Quality assessment tool for collecting data customized from BEME guide of Harden et al. (1999).

Area	Questions	Yes	No
Context	The study is free from personal views		
	The study considers empirical evidence in place of only theory		
	Independent research was conducted by the researcher		
Sample	Size:		
	• Satisfactory		
	• Appropriate		
	Response rate—Satisfactory		
Collection of Data	Unbiased sampling		
	The procedure for collecting data—clear		
	Instrument of collecting data:		
Analysis of data	• clearly explained		
	• developed and piloted properly		
	Data analysis in accordance with the research—matched		
Validity, reliability of data	Findings and validity of data—properly mentioned		
	Findings and reliability of data—properly set up		
	Findings generalization—reviewed		
Conclusion	Data-driven conclusions are made		
	Recommendations are stated from findings		
	Conclusions are justified by the research		

### 3.2. Extraction of Data

Major concepts of method and result were developed by analysing each article. The extraction of the information had been registered in an analytical journal (AJ). The AJ deals with the intensive information of authors, publication date, topic of the research, methodology, sample, method of collecting data, synthesis and analysis of data. The AJ helps to offering transparency to the related audience of the research for additional interpretation and verification of the results (Cook and West, 2012). The format related to the analytical journal is given below (**Table 3**).

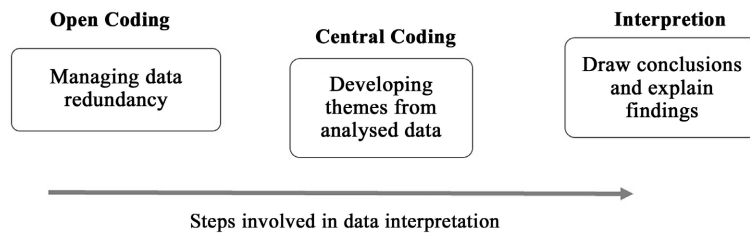
### 3.3. Data Analysis

Thematic analysis of data was used. It permits the interpretation of related data by encapsulating the findings and enables more clarification of related data

**Table 3.** An example AJ for data extraction.

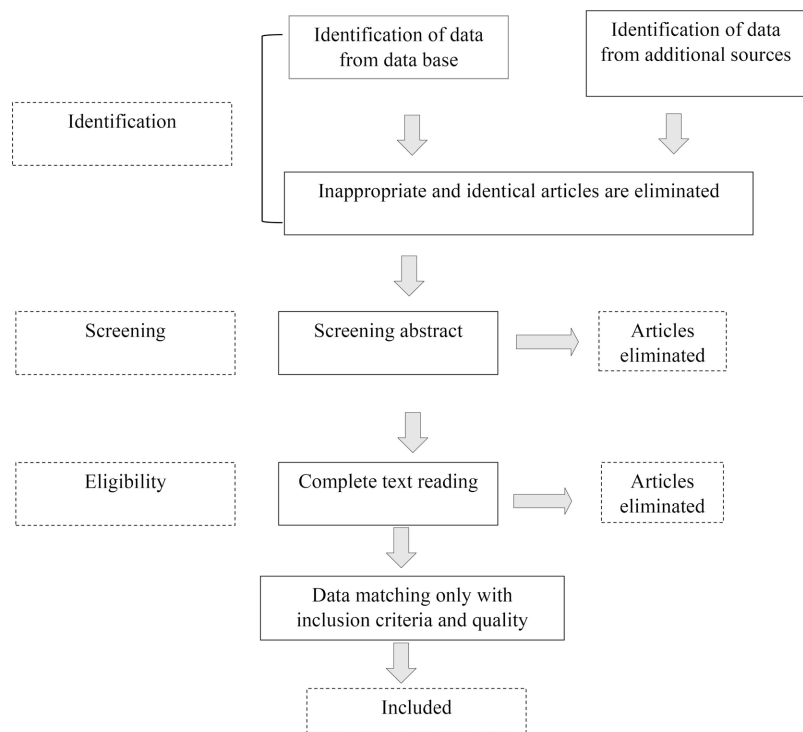
Name of Author(s) (year)	Research focus	Nature of the study	Sample/Tool	Field of study	Analysis of data	Content
Duke et al. (2021)	Impact of PBL to develop literacy	Experimental	Teachers, Likert scale, Informal reading and writing	- Second grade students - Low socio-economic students	Pretest Post test	Experimental group showed higher literacy

(Cook & West, 2012). For the development of the theme, the AJ was also utilized. According to Creswell (2003), the complete process has three phases. They are presented below (Figure 4).



**Figure 4.** Steps of data analysis.

The flowchart (Figure 5) gives a summary of the review procedure. This was taken on from the PRISMA statement of Moher et al. (2009).



**Figure 5.** Summary on the review process of articles reviewed.

## 4. Framework of the Discussion and Findings

In structure with the “political liberalism”, several explanatory and normative theories have been forwarded in social science education to address issues of inequity and justice, like the Nancy Fraser’s three-dimensional model of social justice (Fraser, 2005). Nancy Fraser’s three-dimensional model of social justice is a multilevel normative framework. Though there are gaps in this theory on how to apply and how to respond on prevailing injustice issue and some debates around counter-public spheres and transformative politics, yet the focus of this theory is the participatory parity. According to this model, if any challenge or situation prevents parity of participation, then it is injustice. Already several issues have been discussed above on how unequal participatory access to SL has been perpetuated. To list the issues identified above are gender, race and ethnicity, class structure due to family income, schooling, and economic status. According to this model, gender, race and ethnicity can be deducted under the cultural factors or the recognition. On the other hand, as class structure is due to family income so it can be shortened mentioning poverty. The rest mentioned issues can be deducted into themes like education. Fraser (2005) considers both poverty and education as economic issue or redistribution. It is also to note that issues like, participation to societal activity and contributing to social decision making can be deducted to representation according to Fraser (2005).

**Table 4** below shows the overall framework on how the further discussion is framed.

**Table 4.** Framework of the study.

Dimensions	Concerns	Crux	Demands	Issues identified	Orders of injustice
<b>Redistribution</b>	Substantive issues	Economic	The what	Poverty, Education	Level-1
<b>Recognition</b>	Frame	Cultural and legal	The who	Gender, Race, The member	Level-2
<b>Representation</b>	Process	Political	The how	Put action into public policy, Engagement in public decision making	Level-3

### 4.1. Redistribution

Fraser (2005) mentioned the first order of (in)justice concerns the substantive issue and indicates what is at stake and demands equitable redistribution of rights, opportunities, and resources. From **Table 4**, after the intense discussion in equity issues, poverty and education have been identified as substantive issues.

Poverty as an issue is not new in education. As poverty is due to family income and imparting its impact on education, therefore let’s try to bring the poverty under the umbrella of education and try to capitalize education itself to combat poverty inside the classroom so that poverty may not retard the benefits

of education. Therefore, one good idea would be redistributing the school resources to support the varying socioeconomic conditions. One best resource in educational setting is developing classroom management plan, for instance, might be developing project-based learning (PjBL) as high-poverty classroom management plan (Duke et al., 2021). In the empirical study of Duke et al. (2021), they used both student-led and teacher led activities in classroom where teachers provided explicit instructions to follow and allowed students to work collaboratively and finally concluded that PjBL has potential effects on science learning in high-poverty classroom. Interestingly, long before them, Marx et al. (2004) mentioned though, initially using PjBL in classroom is challenging but it can be beneficial not only in science but also in other subjects of social sciences (Marx et al., 2004; Parker et al., 2011; Parker et al., 2013). Therefore, to challenge the inequity of SL using the Fraser model advances the need to develop a curriculum that will intend to embrace other ideas like this to absolve this education issue. The commission report, the one provides the ground for this whole discussion, also anticipates a curriculum developed in such a way that it promotes knowledge about not only about oneself but also about the world. In this regard, Valladares (2021) suggested a trans and interdisciplinary curriculum to challenge systemic injustice and distribute educational resources. Such a curriculum may help in two ways. Firstly, it will establish interaction between two or more disciplines allowing to study an object in more details and in more systematic and analytical ways. It will help to develop comprehensive understanding of concepts from different dimensions to overcome the challenges of limited and fragmented vision of concept from a single field only. Valladares (2021) secondly mentioned that appropriation of trans and interdisciplinary curriculum will help to allocate the values and methods among disciplines. To argue, she believes integration of philosophy in science education would help to better understand different pedagogies of science. But what she finds most important is such philosophical foundation will help to understand what life, society, culture and their inter relation with education and science education allowing a proper distribution of resource.

To ensure redistribution along with developing curriculum, as a single resource, some argue that more school physical resources will promote more learning (Musset, 2012). It was found that, a well resourceful school had become more successful in promoting SL (Gibbons and McNally, 2013). Therefore, if the institution can avail high configuration computer support and internet facility then application of several computer-generated simulation and academic setting (e.g., WISE, PhET, and SiMSAM) may offer good opportunity to provide high quality education. On this point, Hanushek (1996) argued that simply providing quality education with increased economic support does not sufficiently reduce educational inequality. Better be said, he added, it depends on how the resources are used as most schools are supposed to have basic prerequisite physical resources. But as, the aim is to develop scientific literacy first, so providing additional financial support to economically disadvantaged school may challenge the

issues of maldistribution of resources to education. Thus, along with focusing on available or additional resources, it would be wise to focus on other school variables also to challenge the equity issue. As school is the centre for social interaction among students, therefore, to list, school climate, class size, nature of teachers and even socioeconomic condition of the school itself can be considered school variables and is important to consider as issues to redistribution.

## 4.2. Recognition

Second order (in)justice concerns issues of scope and pertain to the question of who does or does not, count as subject of justice. The frame constitutes both member and non-members of community and the latter one is usually subject to suffer. From **Table 4**, gender, race and members have been identified as cultural and legal issues.

Previously gender and race have been found to make remarkable impact on SL while discussing SL as an equity issue. Therefore, variables related to student background are an important consideration (Gibbons and McNally, 2013). As classroom is a social context therefore, interaction and collaboration among peers and teacher (Fitzgerald & Palincsar, 2019) are important decisive factor in dealing with gender and race and disenfranchise. So, what teacher will teach students and how, the pedagogy, might be one of the effective ways to challenge this cultural issue. Alike commission report, the **National Academies of Sciences, Engineering, and Medicine (2018)** suggests for interactive science curriculum focusing on contents paying special attention to social issues and considering necessities and providing opportunities for developing association among teachers and peer, and among peers. Such curriculum may help neutralizing these issues providing with greater recognition to the traditionally disregarded group.

So, once when what to teach has been decided by the curriculum then the major role is to be played by the teachers mainly as more knowledgeable other (Fitzgerald & Palincsar, 2019; Vygotsky, 1978) and then students. Powell and Grubbström (2021) has proposed an excellent analytical framework to put forward in this regard to include disenfranchised member. To break the vicious cycle of recognition crisis, that framework may come up with opportunities for teachers to improve the classroom challenge. According to the framework, a teacher may play three roles shown in **Table 5**.

The above-mentioned framework attempts to suggest the ways to deal with the gender and race equality issues, but the task is not as simple as it appears to be. There are some more implicit challenges to challenge the recognition issues itself. Jordansson and Peterson (2019) mention basically the progression towards gender and race equality issues is a slow process as it faces the following challenges:

- It is a day-to-day problem
- It is stuck with a grey relationship between position and power

**Table 5.** Analytical framework of Powell and Grubbström (2021).

Teachers' Role	To dos'
Understanding Leadership	<ul style="list-style-type: none"> <li>• Understanding the role as leaders</li> <li>• Recognizing own potentiality and opportunity</li> <li>• Developing competencies</li> </ul>
As leader in classroom	<ul style="list-style-type: none"> <li>• As leader, capitalizing own competencies to gender and race equality issues</li> <li>• Be sure to apply the competencies in the classroom</li> <li>• Rapport building with students</li> <li>• Dealing responsibilities related to gender and race equality issues</li> <li>• Receiving and paying attention to criticism of students</li> </ul>
As role model Professionals	<ul style="list-style-type: none"> <li>• Dissemination of views on gender and race equality issues</li> <li>• Encouraging others</li> <li>• Supporting other</li> <li>• Developing gender and race neutral image at institutional level</li> </ul>

To overcome these, it was Jordansson and Peterson (2019) again who mentioned the role of organizational management and finally, the role of authority to be the most important. And the role is most importantly, but not limited to attempt to outrun the issues along with considering it as a formal mandate. This is how the Fraser model challenges the persisting issues to SL.

But teachers are only a part or segment of the whole academic period of students facilitating the area of expertise only. So, as a member of micro-level of institution, actions of students in this regard are also important to be considerable members of meso and macro level. Therefore, students are expected to express support among themselves and must not perceive that teacher are only accountable person to deal with the challenges of gender and race equality issues (Powell & Grubbström, 2021).

### 4.3. Representation

The third order of (in)justice are matter of process and concern how the participation is determined and how the matter of justice is made and what the effect thereof is on scope of justice.

According to commission, the knowledge should be developed in such a way that it makes “contributing individuals” to society and politics (UNESCO, 2020). Apparently, this contribution can be assumed as benefits of the SL only. But a deep understanding on the inequity issues also directs into the urge of developing individual who can contribute for others, specially for disenfranchised. To mention, in a micro level of institutional setting, students can come up with their allegation and engagement with teachers and higher authorities (Powell & Grubbström, 2021).

#### 4.4. Critical Analysis and Recommendations

To put the theory of Fraser simple, it can be considered as a magic cube where three dimensions are like three intertwined colours. Above discussions adequately come up how combining the three dimensions of Fraser model can precisely challenge the inequity in SL. And the general factors that limit the access to SL is to list here but not the least are trans and interdisciplinary curriculum, gender, race and others.

But, as the inequity has been found to persist, then at this very particular end, the question arises “who is to bell the cat?” It means who should be one to resist the injustice? Should those who are excluded, marginalized, and disadvantaged speak for themselves? If so, then what if they do not have loud enough voices that the majority of the society is not keen to hear, listen to and response to their concern? Should they still be spoken for and if so, then by whom and how? What should be the terms of engagement? Simply converting the above questions into the context of SL appears like:

: who should resist and talk?—The students or teachers or parents or institutional authority?

: Or all?

Or

: to whom?—Parents and students to the teachers and authority or government? Why not also the teachers to authority and government?

: and how!

These questions are again linked to the first of the three-level order of injustice. In this regard, [Nash and Bell \(2007\)](#) bolstered Fraser and mentioned it is to be the one who is privileged to speak for the disenfranchised. In this case, who is the ultimate privileged group? Are they the group of students who have got better opportunities to develop SL? Then more questions arise in the series like do they have the ability and also interest to speak in favour of parity among peers? Or who else it would be?

Therefore, to prevent the vicious cycle of misrepresentation is a major flaw that needs to be checked down.

#### 5. Conclusion

“Why learning is for?”—a question asked by the report “International Commission on the Futures of Education. 2020. Education in a post-COVID world: Nine ideas for public action. Paris, UNESCO” by UNESCO”. SL comes best to answer as it aims to reduce the gap between fact and knowledge and situate individual in an ecosystem of science, economics, cultural and legal and political participation. In this competitive era of struggle, SL is found to be an essential way out as survival of the fittest. Several roadblocks are there in its ways which have been discussed throughout and also some optimist initiatives are put forwarded expecting that unfastening the barriers mentioned here will impart the full utility of SL for oneself and all.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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