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Tel: 1-323-984-7526, 323-410-1082
Fax: 1-323-984-7374, 323-908-0457
E-mail: teacher@davidpublishing.com; teacher@davidpublishing.org; education1548@hotmail.com; or teacher@davidpublisher.com.

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Cartography of the Higher Education and Research System in France: Strategy, Programming, Evaluation, and Operational Units*

Alves Baptista, Tatiane
Rio de Janeiro State University (UERJ), Rio de Janeiro, Brazil

This article addresses the set of changes that have occurred in French higher education (HE) and research system, aiming at a general characterization of its current configuration. For that, it describes the main processes of the system reconfiguration based on the analysis of the current legislation, identifying significant changes concerning the strategic dimension, programming, financing, operationalization, and evaluation. Thus, it focuses on three systematically articulated spheres. In order to understand the reasons behind such changes, this article recovers the global context of adjustments in the so-called "neoliberal wave"—specifically the New Public Management (NPM), so as to place such evidence on the new cartographic framework of HE in France, concluding that the ongoing transformations are part of a global trend in the sector, involving economic elements, the issue of the public financing model, the management of human resources in a logic of competition, and the sophistication of the control mechanisms of the academic work. On the other hand, there are also changes towards the resignification of universities' role as protagonists in the production of innovative and socio-economic solutions. Both trends weigh heavily on one of the most important pillars of higher education and research (HER) institutions, namely the issue of autonomy.

Keywords: higher education and research, university, management and governance, autonomy

Introduction

In a global context, the areas of research, development, and innovation have gained significant importance for the countries' political, economic, and strategic plan. Throughout the 1990's to the 2000's, a significant global wave raised the issue of innovation, consequently stimulating new productions and processes to ensure the competitiveness and sustainability among the countries.

This lever has generated a significant reordering of the legal framework that involves the countries' research system. Notably, with more visibility and impact since the turn of the 21st century, the European

*Acknowledgement: Work under the supervision of C. Paradeise. She is a sociologist who studied at the Institut d'Études Politiques in Paris, at EHESS and at the University of Michigan in Ann Arbor. She took her Ph.D.s (thèse de 3ème cycle and Thèse d'état) in Paris-Sorbonne. She taught at several universities and held many positions of responsibility in French institutions, such as the CNRS Humanities and Social Sciences department (SHS) from 1990 to 1994 and Ecole Normale Supérieure de Cachan. Emeritus Professor of Sociology at the Paris Est-Marne-la-Vallée University, she participated in the creation of the Institut Francilien Recherche, Innovation, and Société (IFRIS), based in Paris, where she is a honorary president.

Alves Baptista, Tatiane, Ph.D., associate professor, researcher at Rio de Janeiro State University (UERJ), Latin American Faculty of Social Sciences-FLACSO and the LaboratoireInterdisciplinaire Sciences, Innovations, Société-LISIS/France.

community, at a strategic level, has produced an intense reordering process that led to the creation of new structures, new financing mechanisms, and new processes of evaluation of its higher education and research (HER) system.

The so-called "neoliberalism"[1] has led the governments of practically all western Europe, the USA, and Latin America to make a set of changes in the labor world with consequences evidently economic, but reaching social life, both in its objective (job market, consumption, and public services), as in its subjective and ethic dimension (environment and sustainability, consumption, innovation, and commodity fetish) (Mészáros, 2001).

Thus, this stage had significant impacts on education, as this area represents a challenging field for neoliberal governments, especially those from countries with a development pattern based on the welfare state, as in France's case.

In the midst of the social question metamorphoses (Castel, 1998), the difficulties in the area of education were felt. In fact, education, as a legally guaranteed social right, imposes high budget investments on the rulers, since it is the space of formation, critical thinking, and the debate of ideas, it is configured as a field of disputes, conflict, and resistance.

Considering universities and research activity from the perspective of these reforms, it is noted that their role has been scaled to a high degree, leaving well-marked contradictions in the path. On the one hand, the university and research are fundamental for overcoming challenges through innovative solutions; on the other hand, there is a pressure to reduce budget, limiting their autonomy and freedom.

At the basis of neoliberal reforms was the crisis of the Fordist production model. In fact, concomitant with neoliberalism, the Fordism crisis gave way to a broad process of restructuring called "flexible accumulation" (Harvey, 1996). Such a model is marked by a direct confrontation with the rigidity of the Fordist mode of production. The new model is based on the flexibility of work processes, job markets, and especially products and consumption patterns. It is characterized by the emergence of entirely new productive sectors, new ways of providing financial services, new markets, and above all, highly intensified rates of commercial, technological, and organizational innovation.

Flexible accumulation involves rapid changes in development patterns across sectors and across geographic regions, creating a vast global movement in areas, such as human health, the environment, information technology, and energy resources. It can be said that it is no coincidence that such areas are now included in the reports of international agencies, such as the United Nations (UN)[2], which set as the planet's challenges for the millennium: poverty eradication, sustainable agriculture, health and well-being, gender equality, areas of industry, innovation and infrastructure, water/ecosystem life, and coastal resources.

The UN, for instance, urge countries to undertake multidimensional solutions to multi-dimensional challenges. Indirectly, international agencies point to an agenda whose protagonist aims to minimize or overcome the social, environmental, and cultural gaps left by a development model based on inequality. In this context, the knowledge, innovation, and applicability of new solutions become fundamental actors. At the same time, it is vital to say that the call for innovation is also part of contemporary productive strategy, where

[1] There is a vast literature on the effects of the neoliberal agenda, for a deep approach on the effects of neoliberalismo (see Anderson, 1995, pp. 9-23).

[2] The global goals for sustainable development. *Global Goals*. Retrieved August 10, 2019, from https://www.un.org/sustainabledevelopment/sustainable-development-goals/.

"commodity fetishism", as defined by Marx in *Capital*, seems to have reached its highest degree.

It is from this background that this article aims to map the research and innovation system in France, considering that from this mapping it can be identified the aspects of management and governance required.

Methodology

France has a long and complex history involving HE and science, and therefore has a rich institutional landscape of great diversity of establishments and universities, grandes écoles, institutes that bring in themselves expressions of the long history symbolized by the Sorbonne, since its foundation in 1253 by Robert de Sorbon.

In fact, France has been following the transformations of the current world reflecting the global tendency to stimulate knowledge production with an emphasis on innovation. Obviously, these transformations follow contour lines that shake and redirect the system, especially the impacts resulting from neoliberalism in Europe beginning in the 1990s, as discussed above, but bringing specificities, including those resulting from the agenda of adjustments present in the so-called "New Public Management (NPM) Policy"[3], implying a significant contrast to the standards that were characterized in heavy public budgets, mass access, universality, and its derivations.

Not surprisingly, France has undergone an intense process of legal, political, and institutional reorganization, confronting a historical pattern of institutional development with another model of management, financing, production, performance, and evaluation. All of these changes were based on the prerogative that a new position of universities had to be engineered nationally and internationally.

Law Edgar Faure - 1968	• Creates the Établissements à Caractère Scientifique et Culturel (EPCSC). • The « former colleges » were replaced by Unités d'Enseignement et de Recherche (UER).
Law Savary - 1984	• It included the universities and grandes écoles in the same text called Établissements Publics à Caractère Scientifique Culturel et Professionnel (EPSCP).
Process of Bologne - 1999	• New training architecture becomes valid throughout Europe, harmonizing higher education in these countries.
Espace Européen de la Recherche (EER) - 2000	• It establishes European research policy based on scientific excellence, competitiveness, innovation and cooperation.
Law April 2006	• Creation of two new organizations: the National Research Agency (ANR) and the Agency for the Evaluation of Research and Higher Education (AERES). • Establishment of a new legal framework involving the foundations of scientific cooperation.
Law of 10th August 2007	• Institute new parameters of Libertés et Responsabilités des Universités - LRU.
***Programme d'Investissements d'Avenir* (PIA -1) 2010**	• 35M Euros a) increase in the financing of projects b) support for the emergence of excellence centers, combining research organizations and universities c) reinforcing the competitiveness of the French economy by improving the transfer of public R&D results to the business world.
***Programme d'Investissements d'Avenir* (PIA-2) 2014**	• 12M Euros a) increase in the financing of projects b) support for the emergence of excellence centers, combining research organizations and universities c) reinforcing the competitiveness of the French economy by improving the transfer of public R&D results to the business world.
***Programme d'Investissements d'Avenir* (PIA-3) 2017**	• 10M Euros a) increase in the financing of projects b) support for the emergence of excellence centers, combining research organizations and universities c) reinforcing the competitiveness of the French economy by improving the transfer of public R&D results to the business world.

Figure 1. Documents analyzed.

[3] On the NPM policy and its impacts on HE in the European context (see Thoenig & Paradeise, 2013).

Considering this broad movement of organizational restructuring, it was important for this study, through a methodological point of view, to map out its three structural spheres of the French system of HER, notably: the political sphere, the programming sphere, and the sphere of the system execution. To perform this mapping, it was made a documentary analysis of the legislation and the main regulatory processes of the sector, according to Figure 1.

Given this scenario, it was inevitable to examine the contradictions imposed through the legal and institutional implemented adjustments, since such adjustments generated new routes of funding, evaluation, and organization of academic work and areas of support both in terms of territory and time of the processes organization and their results.

This set of changes inform about the creation of a new socio-institutional pact, involving research organizations, government, and universities, and that this pact was made in an arena of intense disputes about the ethical-political direction of the sector. Thus, the article seeks to characterize what these changes fundamentally mean.

Discussion

French Innovation System: Re-articulation and Aspects of the Legal Apparatus

The search for a new legal framework has moved the French HER system. The reforms highlight the efforts of the political sphere to make the system less fragmented and more adapted to international demands.

From the point of view of the French legal apparatus, we can note from the *Edgar Faure Law* of November 12, 1968, a reorientation of HE institutions, creating the Établissements à Caractère Scientifique et Culturel (EPCSC). The old colleges disappeared and were replaced by Unités d'Enseignement et de Recherche (UER). Units that are based on the principles of autonomy, participation, and multi-disciplinarity. However, it is important to note that this new law, although it has brought a significant change, kept the system divided into two distinct groups: on the one hand, the grandes écoles; on the other hand, the universities.

It was only in 1984, following the same basis of principles-autonomy [4], participation, and multidisciplinarity—that the *Savary Law* included the universities and grandes écoles in the same text and promoted more open universities for the outside world, from then on called Établissements Publics à Caractère Scientifique Culturel et Professionnel (EPSCP).

However, this ambiguity—Universities x the Great Écoles—has become systemic and when added to the fact that research activity has long been linked to external organisms, such as CNRS, it forges a system that is notably known for its fragmentation (Paradeise, 2013).

This feature of the French system has become one of the reforms' targets, with the aim to standardize the system due both to consequences and to the global resource optimization agenda. Thus, the search for overcoming the fragmented character of the system motivated an important part of the ethical-political re-articulation actions undertaken in France.

It is also important to emphasize that, on the one hand, the contraction of the state and the consequent decrease in the demand for hiring personnel, in the neoliberal context, has retracted the role of the Grands Écoles, especially in their social purpose of establishing frames focused on the administrative and economic

[4] Administrative autonomy: Universities and Training and Research Units (UTRU) are administered by an elected council and headed by a president and elected officials; pedagogical autonomy: The universities determine the methods of teaching and control of knowledge; and financial autonomy: The financial autonomy of universities was established by the Faure Act of 1968.

system, “The so-called state elites”. On the other hand, the consolidation of an international HE assessment and ranking model—carried out by international agencies, such as the Shanghai Ranking, for instance—has led institutions to reorganize themselves into systems that are inseparable between education and research. This conformation led to a reduction in human resources expenditures in the area, as they began to be concurrently allocated to training and research activities (Paradeise, 2013).

Moreover, international pressure has led the Grands Écoles to host a significant research effort, resizing—over the past 20 years—their institutionality beyond their original priority of elite formation. For universities, the impact of globalization has imposed a new aesthetic of “academic excellence”, where universities have been forced to change their own conception, redirecting the way traditionally conducted training, “disinterested” research and the promotion of culture, as Paradeise (2013) explained.

Nevertheless, the French system is rich in nuances and has a tradition forged in political principles that derive from the status of equality that underlies French social democracy, whose direction pointed to the massification of access linked to a uniform and centralized legal design from national laws. Thus, one of the visible impacts of globalization was to question this institutional design, weakened by its weight in terms of budget and the international pressure placed by the ranking processes.

Paradeise (2013) stated that French HE is far from the stratified model that prevailed in the United States, where competition and internal differentiation feed an atmosphere of high-performance academic production, fundamentally regulated by parameters that are disseminated by the academic community itself, and funded in the competition circuit, in partnership with external actors. It can be said that the American model has been consolidated in three dimensions: balanced and competent governance, high impact academic lines, internal and external thematic tuning, abundant financial resources, and concentration of professors and students talent (Paradeise, 2013).

Currently, there are 138 EPSCP[5], including: 19 Communautés D’universités et Établissements, 67 universités, one Institut National Polytechnique, 22 Instituts et Écoles Extérieurs aux Universités, 20 Grands Établissements, five Écoles Françaises à L’étranger, and four Écoles Normales Supérieures. In addition, France also has 95 Établissements Publics à Caractère Administratif (EPA) and other bodies.

The EPSCP aim at the success of all students, the research development, the necessary support for training, the diffusion of knowledge in its diversity, and the increase of the scientific, cultural, and professional level of the nation and its individuals, the economic growth and competitiveness, as well as the implementation of an employment policy that embraces economic, social, environmental, and cultural needs and a foreseeable development; in addition to affirming ethical values, such as fighting against discrimination, reducing social and cultural inequalities, and achieving equality between men and women by ensuring that all those who are willing and capable will have access to the higher forms of culture and research. To this end, they contribute to the improvement of the students’ living conditions; promote students’ sense of belonging in the community of

[5] According to current legislation, *Article Law 123-3, Loi No, 2013/2013*, the public HE service has the following mission: (a) initial and continuing training throughout life; (b) scientific and technological research, dissemination, and exploitation of its results at the service of society. Based on the development of innovation, transfer of technology where possible, the ability to transfer knowledge and support to associations and foundations, recognized as being of public utility, and in the public policies carried out for social challenges and for social, economic, and sustainable development; (c) orientation, social promotion, and professional insertion; (d) dissemination of humanistic culture, in particular through the development of human and social sciences and scientific, technical, and industrial culture; (e) participation in the construction of the European Higher Education and Research Area; and (f) international cooperation.

their establishment, reinforce social cohesion and the development of individual or collective initiatives for the solidarity and motivation of student life; and build an inclusive society. Therefore, it seeks to promote the inclusion of individuals, regardless of their social origin and health condition. Among the French system's goals are the construction of the European research and higher education area and the promotion of territorial attractiveness and influence at local, regional, and national level.

It is worth highlighting the European higher education area aquisition, starting with the Bologna Process (1999). From this point, the French curriculum was reorganized into three grades: Bachelor, Master, and Doctorate (LMD). This new training architecture became applicable throughout Europe and harmonized HE in these countries, facilitating comparison, equivalence, and mobility.

Similarly, the notion of the Espace Européen de la Recherche (EER), created in 2000, reflected the European Union's desire to implement a coherent and concerted European research policy based on scientific excellence, competitiveness, innovation, and cooperation, with the challenge of avoiding the fragmentation of research efforts, fostering cooperation among European scientists.

With regard to the French research system, the Law 2006 of April 2006 can be considered as one of the most significant elements in this process. This law led to the creation of two new organizations to contribute funding (the National Research Agency—ANR) and assessing the French scientific outcomes of research and HE institutions (the Agency for the Evaluation of Research and Higher Education—AERES). This law creates, in the same line, a set of structures designed to facilitate the cooperation among various types of HER institutions, such as the research and higher education networks (PRES) and the thematic networks of advanced research (RTRA). However, what is evident about valuing the innovation at a strategic level was the establishment of a new legal framework involving the foundations of scientific cooperation, conferring the same authority, responsibility, and legitimacy of the research management in order to facilitate and streamline the transfer of knowledge and technologies.

The Center Français des Fonds et Fondations is currently one of the major supporters of foundations in France, expressing a plural field of action both in thematic terms and purpose. In this sense, the new legal framework of foundations meant the consolidation of a field of action in technical and operational terms to develop public policies and innovation[6].

This same law examines the foundations, reaffirming their importance for the viability of partnerships in

[6] Members of the Centre Français des Fonds et Fondations Association des amis de Gustave Eiffel; Association Institut de Myologie AIM; Association Ensemble pour l'éducation Les fondations; Fondation ACOME; Fondation Afnic pour la solidarité numérique; Fondation Alpes Contrôles; Fondation ENA; Fondation d'entreprises ESTIA; Fondation EOVI; Fondation Etoile; Fondation française pour l'archéologie; Fondation François d'Assise; Fondation Jeanine et Maurice Mérigot; Fondation Gustave Roussy; Fondation I3M; Fondation Kronenbourg; Fondation KUNZ; Fondation de la Mer; Fondation Mines TelecomFon; Dation de la mutuelle générale; Fondation Mutac; Fondation Ouishare; Fondation Paris Habitat; Fondation Rémy Cointreau; La Fondation Saint-Irénée; Fondation Samu social de Paris; Fondation Société Générale Solidarité; Fondation SOMFY; Fondation Toulouse Cancer Santé; Fondation Vasgos; Fondation de l'Université de Nantes; Fondation Université Picardie Jules Verne; Fondation Yves Rocher.Besides the associated foundations, the CFF has partnership with the French American Charitable Trust (FACT); Fondation Apprentis d'Auteuil; Fondation de l'Avenir; Fondation Bettencourt Schueller; Fondation Bocuse; Fondation Calouste Gulbenkian; Fondation Caritas France; Fondation Chanel; Fondation Culture et Diversité; Fondation Daniel et Nina Carasso; Fondation de France; Fondation d'entreprise; AG2R La Mondiale; Fondations Edmond de Rothschild; Fondation Entreprendre; Fondation Entreprise Réussite Scolaire ; (FERS) Fondation Fourvière ; Fondation des Gueules Cassées ; Fondation Henriette-Anne Doll; Fondation Hippocrène; Fondation Macif; Fondation Maison des Sciences et de l'Homme (FMSH); Fondation Mérieux; Fondation Notre Dame; Fondation OCIRP; Fondation Pierre Bellon; Fondation Potentiels et Talents; Fondation pour l'Univesité de Lyon; Fondation Robert Abdesselam; Fondation ROVALTAIN; Fondation Saint-Irénée Lyon; Fondation Scaler; Fondation SNCF; Fonds de dotation Après Demain; Fonds de dotation SEPR AVENIR; Institut Pasteur; OMEM (Œuvre Montpellieraine des Enfants à la Mer) et Institut Saint-Pierre.

the creation of excellence centers with international visibility. It also establishes confirmed the association between public research organizations and HE institutions through the joint research centers which had developed since the 1990's.

Within the same scope, France approved the Law of 10th August 2007 (Libertés et Responsabilités des Universités—LRU), broadening universities' competences and accountability on budget allocation and human resources management. Its objective was to strengthen the autonomy and broaden the universities' responsibilities, considering sensitive fields, such as the renewal of governance mechanisms, the increase of the Dean's powers, the strengthening of regional and university partnerships, favoring a multiannual planning of the institutions, and finally, the attribution of new responsibilities to institutions, such as personnel payroll management and wealth management.

As it can be noted, much of the efforts undertaken in the context of the re-articulation of the French HE system pointed to the need to overcome the historical fragmentation, however, according to Paradeise's diagnosis (2013), in order for a fragmented system to be effectively recomposed into a concentrated system, it would be required, in addition to the political will of the authorities involved investment, and above all, in the author's words: "an autonomous and radical evolution of the institutions' internal governance".

From the Public Fund's Global Stagnation to a Segmented Investment Model

Following the global tendency to pursue rigid behavior with public expenses and the downsizing of the state sector, the policy adopted in France through successive reforms led the French universities to suffer considerable impacts.

Historically responsible for providing open and free access training, the French university is internationally recognized and is one of the most sought after destinations—for training and further education—by students and researchers from around the world[7]. It is worth noting its redistributive role, as it is part of the mechanism of guarantee of rights, forming and opening fields of insertion in the labor market to all social segments.

However, it was in the troubled scenario of the economic crisis that hit European countries, when the unemployment rate among young people in France reached 24.4% in April 2013, that the lifespan of HE institutions became more evident through against a backdrop of wage conditions, bureaucratic rigidity and difficulties in retaining talent (Paradeise, 2013).

Indeed, it is in this field of funding that the university—Great Écoles Duplicity stands out, for example, in terms of the average expenditure per student: "50,000 euros at the École des Mines x less than 7,000 euros in some universities" (Paradeise, 2013), revealing a fragile imbalance in terms of priority and recognition.

In this sense, the debate arises from the universities ability to produce internal mechanisms in order to overcome the crisis, where the theme of university autonomy (especially financial autonomy) is pointed as a possible exit route. Gradually, the sustainable model becomes a possible answer. In such a model, symbolically played by American universities, competition, and partnership with external actors outweigh public investment.

However, as university autonomy is known, especially in the US, it is followed by what Paradeise (2013)

[7] An evidence of this factor is the liveliness of the Cité Internationale Universitaire de Paris—CIUP. Founded in 1925 and located in the heart of Paris, Cité U. receives 12,000 people annually among students and researchers from 140 nationalities; it currently has 40 maisons and a capacity expansion plan and 31% by 2020. Retrieved August 19, 2019, from http://www.ciup.fr/accueil/les-maisons-et-les-residents-12203.

called the virtuous circle between “autonomy, resources and a balanced governance model”, an indispensable circuit for such a model to produce positive results, generating mutual trust between academics and institutions, executive legitimacy for project and partnership management, fundraising, solid reputation, and attraction and retention of talent (professors and students).

In France, although universities have been subjected to a new rationality in terms of budgets, with emphasis on the reduction of direct funding, it is noted that the investment model has remained mostly public, however, its implementation was deepened towards competition, segmentation, and diversification through public notices.

From this point of view, in 2010, the French government launched the Programmed Investissements d’Avenir (PIA). According to the Secrétariat Général pour l’Investissemente (SGPI), the program between 2010 and 2017 has a budget of 57 million euros, distributed as follows:

1. PIA 1: € 35 million (2010)—HE and training: € 11 billion; Research: 8 million euros; Industrial sectors and SMEs: EUR 6.5 billion; Sustainable development: 5 million euros; Numerical economy: and 4.5 million euros.

2. PIA 2: 12 million euros (2014)—HER: € 3.7 million; Energy transition, thermal renovation, and the cities of tomorrow: € 2.3 million; Innovation for a sustainable industry: € 1.7 billion; Technological excellence of the aeronautics and space industries: 1.3 billion euros; Technological excellence of defense industries: 1.5 billion euros; Youth, training, and modernization of the state: 600,000 euros; Digital economy: 600,000 euros; and Health: 400,000 euros.

3. PIA 3: 10 million euros—included in the credits of the Grand Investment Plan (2017)—HER: 2.9 million euros; Research valuation: 3 million euros; and Innovation and business development: 4.1 million euros.

The program is a milestone in the realm of French research and innovation, and is aimed at: (a) increasing the financing of projects, exclusively using procedures of publiccompetition; (b) supporting the emergence of excellence centers, combining research organizations and universities—excellence centers; and (c) reinforcing the competitiveness of the French economy by improving the transfer of public reasech and development (R&D) results to the business world and the mechanisms for promoting research.

The following graph shows the investments evolution in selected projects and highlights the program size and importance, according to Figure 2 as below:

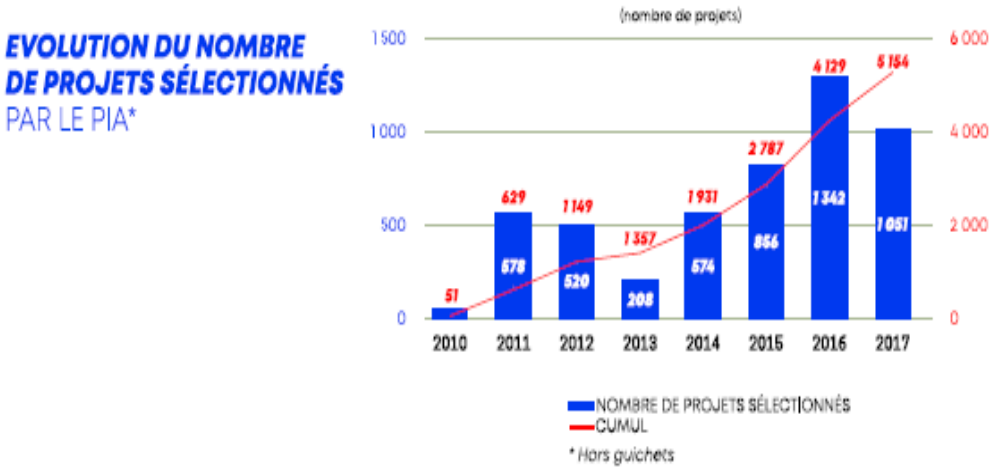

Figure 2. Investments evolution in selected projects—PIA (2010-2017) (Source: SGPI, 2017).

With such schemes France has established a strategic horizon clarifying the respective roles of political decision-making and actors in charge of implementing funding and assessment of HER institutions.

Although significant, both in terms of the financial volume invested and the relevance of the thematic agenda, the program was not able to create organizational, political, and academic behavior to overcome the obstacles of the old inherited institutional model, especially the issue of autonomy, hindering the international position of French HE. In this regard, HE institutions have organizational, financial, human resource management, and even academic autonomy weaknesses (Paradeise, 2013).

Results

HE Research and Innovation: General Structure in Articulated Spheres

The sphere of political-strategic decisions. It can be said that the French HE, research and innovation system is organized from three spheres: the political, the programming, and the executive.

The sphere of political-strategic decisions impacting HE and R&I in France include the parliament, the government, the ministries, the European research space, and the higher councils of science and technology.

Two higher councils perform in this sphere, the Strategic Research Council, composed of 26 members, responsible for proposing the main guidelines of the national strategy for research, technology transfer, and innovation, and the National Council for Higher Education and Research (CNESER), which is an advisory body of the ministers responsible for HER. CNESER is comprised of 100 members and is chaired by the Prime Minister. It was created in 1968. The composition of this council includes, in addition to representatives of civil society, representatives of students, and regional interests.

Thus, the sphere of political definition (Bobbio, Matteucci, & Pasquino, 1999) is established at an arena where projects dispute the sector's direction. This affirmation allows us to say that such guidance keeps a bias of tension and provisionality, which explains the constant zigzag in recent years.

Historically, as Paradeise (2012) explained, there is a significant interconnection between the social and economic development model of countries and the design adopted by these countries' universities, making it possible to identify over time three to four major international models.

The Napoleonic model-centralized, with financing under state control and strongly linked to the increasing modernization of countries—this model prevailed in southern European countries. An important feature in this case is their legal status whose prerogative involves nationally all institutions, defining their resources among other parameters, such as nominations, forms of government, and access mechanisms. The Humboldtian model, which brings together Germany and the countries of Northern Europe, is characterized by its independence, seen as a necessary condition for the quality of the produced knowledge. The British model pursues the same goal of independence and is characterized by its independent state financial management. And lastly, and currently a spearhead in terms of what has been considered the "ideal model", the American model, largely inspired by the Humboldtian, is early distinguished from its European counterparts, placing the emphasis on local organization and financial autonomy, on the notion of "useful knowledge" and the development of close ties with the economy (Paradeise, 2012).

Such models reflect their own institutional cultures, which over time have unfolded into parameters of work organization, academic profile, recognition parameters, decision making, outcome evaluation, etc., dimensions that are grounded and tacitly based within the institutions.

Heir to the Napoleonic tradition, French HE, although strictly autonomous, has its internal parameters controlled by the political sphere. In order to understand the mutations of the French system today, once again the neoliberal adjustments are identified here in the New Public Management (NPM), according to which mass access and the sector budget suffer towards its retraction, generating a pulsating engine for the funding diversification. A model that follows the neo-recessive wave of many European countries (Paradeise, 2012).

This set of actors has the role of proposing, debating, formulating, legislating, and guiding strategic programs of research and innovation, according to the political, economic, and social interests of the country, as expressed in Figure 3.

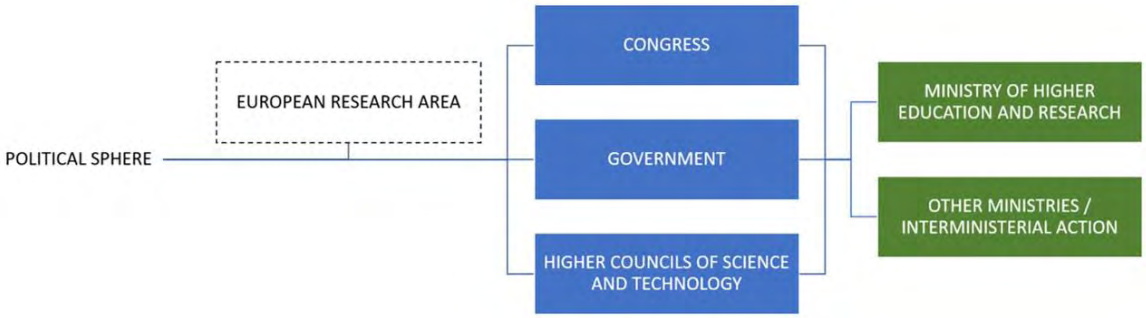

Figure 3. Political and strategic sphere (Source: The author).

The sphere of programming, financing, and evaluation. The remarkable movement of the sphere reflects the most sensitive point of the HE system. In fact, the imposition of a leaner budget model led to the development of new mechanisms of organization, financing, and control in the pursuit, on the one hand, of rationalizing public investment based on the NPM, and on the other hand, the need to provoke academy a new productive behavior vis-à-vis international competition and the role of knowledge in economic dynamics in a "knowledge society" (Paradeise, 2012).

From such references, it is possible to identify another area of the system, the sphere that involves programming agencies, whose purpose is to recognize and make projects feasible according to their excellence standards.

Therefore, National Research Agency (ANR), BpiFrance Financement (ex OSEO), AERES, and the foundations are part of the programming area.

Founded in 2005, the ANR has been responsible for developing and publishing the *Annual Action Plan for Research and Innovation*, meant to implement the so-called "National Research Strategy" (Stratégie Nationale de la Recherche-SNR) that identifies parameters defined by the system's sphere (Décret 2014-402 du 16 avril 2014).

The national strategy for research and technological development, according to the ANR, aims to: (a) increase knowledge; (b) share the scientific, technical, and industrial culture; (c) promote research results at the service of society. To that end, it focuses on the development of innovation, the transfer of technology where it is possible, on the expertise capacity and support to associations and foundations, recognized as public utility and on policies to social challenges, social development needs, economic and sustainable development; and (d) promote the French language as a scientific language.

The ANR's actions must encompass the so-called "social deficits", such as:

(a) resource and climate change management;

(b) clean, safe, and effective energy;
(c) healthy living and well-being;
(d) food security and population deficit;
(e) mobility and durable urban systems;
(f) information and communication society;
(g) innovative, integrative, and adaptive society;
(i) freedom and security of Europe, its citizens and residents.

From the financing point of view, the ANR establishes two categories of funding: thematic programs, which account for 50% of the budget; exploratory research programs (White Program, Jeunes Chercheurs Program, Post-Doc Return Program, Chairs of Excellence Program, and International White Program), targeted by the other 50% of the available resources.

Currently, according to the Ministry of National Education, HER, 431,100 people work in this sector, including 284,800 researchers. Data from 2016 report that France invested 2.2% of its gross domestic product (GDP) in research, as shown in Figure 4, development and innovation:

Recherche - Développement - Innovation*	(2016)
Dépense intérieure de R&D (DIRD*) en 2016 (en Md€)	49,5
Dépense intérieure de R&D des entreprises (DIRDE*) (en Md€)	32,2
Dépense intérieure de R&D des administrations (DIRDA*) (en Md€)	17,4
DIRD / PIB (en % du PIB)	2,2
Effectifs de la R&D en 2016 (en ETP*)	431 100
Chercheurs* en 2016 (en ETP)	284 800
Personnels de soutien* en 2016 (en ETP)	146 300
Sociétés innovantes en 2016 (en %)	51

Figure 4. Investment in research and innovation (Source: Ministère de l'Enseignement supérieur, de la Recherche et de l'Innovation [MESRI]).

Therefore, it is worth noting that the sphere of programming comprises research organizations, which are subdivided as follows: the Etablissements Publics Scientifiques et Technologiques—EPST involve the Center National de Recherche Scientifique (CNRS), the Institut National de Recherche (INRIA), the Institut National de la Recherche Agronomique (INRA) and the Institut National de la Santé et de la Recherche Médicale (INSERM); and the Etablissements Publics à Caractère Industriel et Commercial—EPIC, which involve the Commissariat à l'Energie Atomique et Aux Énergies Alternatives—CEA, and the Center National d'Etudes Spatiales—CNES. Foundations, such as the Pasteur Institute, the Curie Institute, etc. And the BpiFrance Financement (formerly OSEO) that fund innovation companies—especially Start Ups as well as Micro- and Small Enterprises—at all stages of their development—in credit, guarantee, and equity. Bpifrance offers follow-up of innovation projects and internationalization of these companies.

Support includes counseling, partnership with the university, networking, and acceleration program[8].

The system also receives funding from the competitive schemes of other organizations, such as the European Community Resources. As shown below, France received € 3,761,102.493 billion for investment in research and innovation, according to data from 2019 (see Figure 5).

[8] Retrieved from http://www.bpifrance.fr.

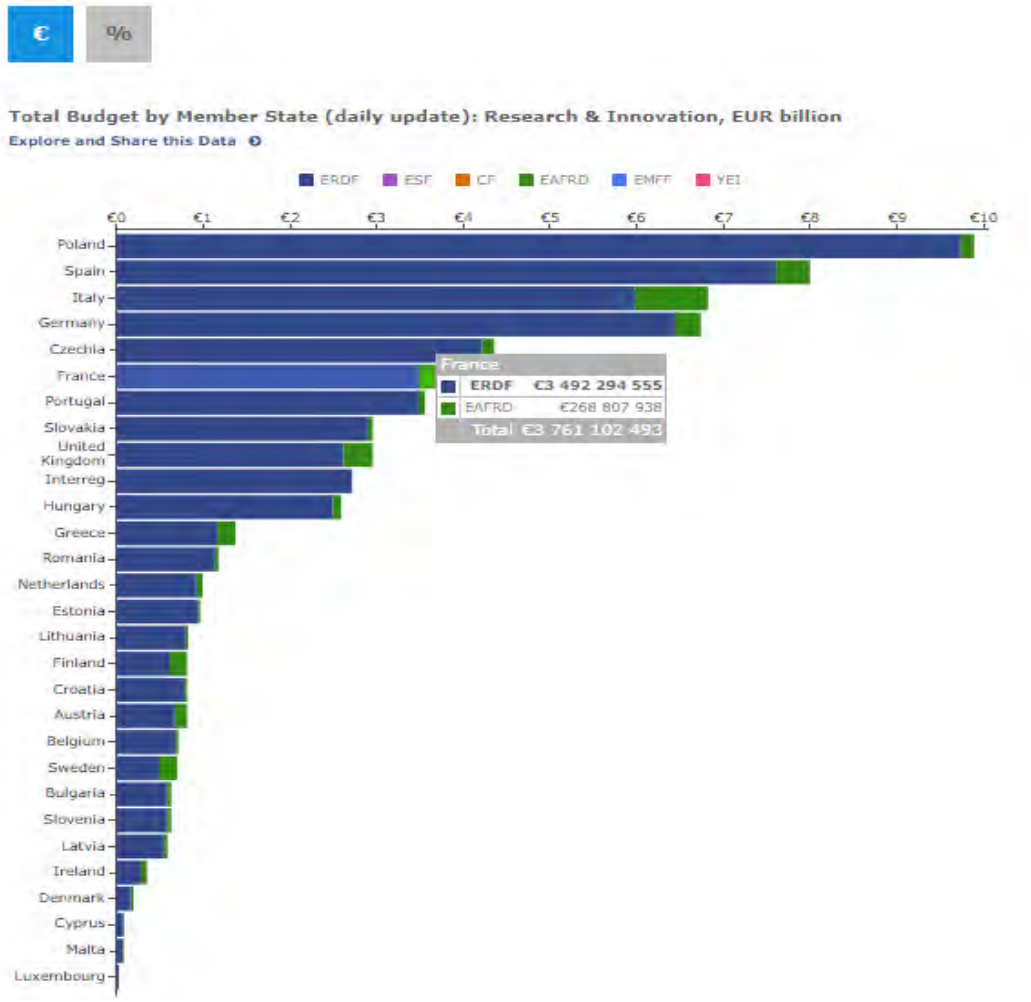

Figure 5. Budget by member state: European Community Resources (Source: Retrieved from https://cohesiondata.ec.europa.eu/themes/1).

In addition, it is identified in the sphere of programming, financing, and evaluation:

The Ministères de l'Europe et des Affaires Étrangères (MEAE), de la Défense, des Transports, as regions and companies based on shared interests and stimulated by the development of the Pôles of Compétitivité.

In the field of evaluation, Law 660 of July 22, 2013 created the Higher Council for the Evaluation of Research and Higher Education (HCÉRES), which replaced the AERES on November 17, 2014. Its organization and its missions are defined by Decree No. 2014-1365 of November 14, 2014[9]. The following Figure 6 represents the actors' procedure in the scope of programming, financing, and evaluation.

[9] In order to guarantee its mission the evaluation body enjoys the status of independent administrative authority, which allows it the impartiality of its evaluations against the evaluated parties or other interested parties' influence. Its reports are publicly accessible, respecting the principle of transparency of all its methods and procedures, conducting its actions in accordance with international standards and European guidelines for quality guarantee in HE. Its mission is to evaluate all HER institutions in France (universities, grandes écoles, research organizations, HE institutions, research units, doctoral schools, courses L/M/DLicence/Master/Ph.D.); validate the assessment procedures implemented by other agencies; evaluate, according to demand, foreign HE institutions; produce analyzes and indicators based on the work of the observatories of science and technology (OST), department of Hcéres; contribute to the definition of a national policy of scientific integrity (NPSI), observing practices and support actors in the implementation of its duties, counting on the French office of scientific integrity (OFIS), Department of Hécéres. Retrieved from https://www.hceres.fr/sites/default/files/media/downloads/Hceres_Plaquette_Presentation.pdf.

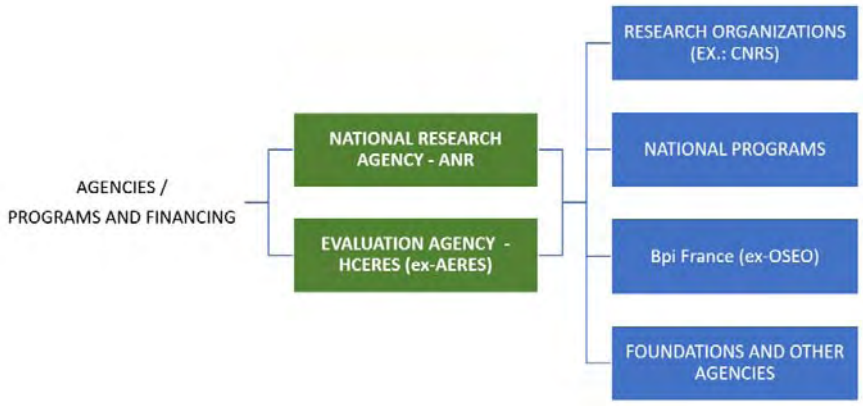

Figure 6. Sphere of programming and financing of the research and innovation system (Source: The author).

The operational sphere. Finally, at the base of the system is the operational sphere, Figure 7, which is composed of a rich architecture, from research units, universities, Grandes Écoles, HE establishments, actors involved in the commercialization and evaluation committees (HCERES).

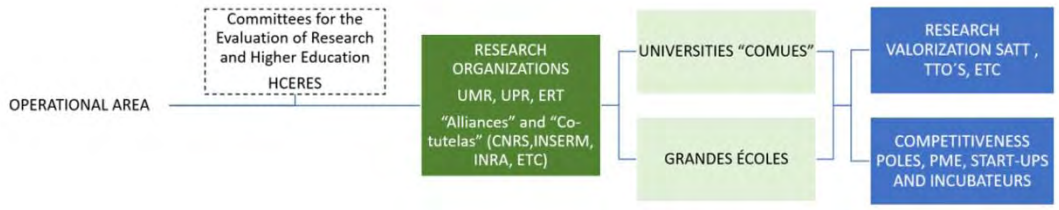

Figure 7. Sphere of production of the research and innovation system (Source: The author).

The research units can be joint research units (UMRs), clean research units (UPRs), or technological research teams (TRTs). Such units are multi-management connected to one or more research organizations, for example, CNRS, INRA, etc[10]. The UMR creation, evolution, or elimination is a prerogative of the Ministry of HER, which is based on the HCERES five-year evaluation.

The TRTS are teams that, in partnership with the industry, conduct medium term researches in the scope of projects that seek to remove technological blocks related to problems that do not have immediate solutions.

Following a strategy of strengthening the network of collaborations among universities, research centers, and other organizations, in order to combine academic and expertise interests by sharing skills, resources, and scientific production culture, the Centers of Research and Higher Education (PRES) were created. Soon after

[10] The UMR allow for the collaboration of various institutions of HER in the same laboratories, such as: CNRS—Centre National de la Recherche Scientifique; INRA; INSERM—Institut National de la Santé et de la Recherche Médical; CEA—Commissariat à l'Energie Atomique et aux Energies Alternatives; INSEE—Institut National de la Statistique et des Etudes Economiques; Instituts Curie et Pasteur; ADEME—Agence de l'Environnement et de la Maîtrise de l'Energie; ANDRA—Agence Nationale pour la gestion des Déchets Radioactifs; BRGM—Bureau de Recherches Géologiques et Minières; IFP-EN—Institut Français du Pétrole-Energies Nouvelles; IRSTEA—Institut national de Recherche en Sciences et Technologies pour l'Environnement et l'Agriculture; CIRAD—Centre de coopération Internationale en Recherche Agronomique pour le Développement; CEE—Centre d'Etudes de l'Emploi; ONED—Observatoire National de l'Enfance en Danger; CNES—Centre National d'Etudes Spatiales; IFREMER—Institut Français de Recherche pour l'Exploitation de la MER; INED—Institut National des Etudes Démographiques; INRA—Institut National de la Recherche Agronomique; IFSTTAR—Institut Français des Sciences et Technologies des Transports, de l'Aménagement et des Réseaux; INRIA—Institut National de la Recherche en Informatique et en Automatique; INRS—Institut de Recherche et de Sécurité; and IRD—Institut de Recherche pour le Développement.

the law of July 22, 2013 created the communautés d'universités et d'établissements (COMUES). It is the EPSCPs that coordinate training offers and strategies for research and transfer of HE institutions. The COMUES[11] replaced the PRES. This strategy is expressed through the so-called "alliances". The "alliances" were created between 2009 and 2010 to foster inter-organizational coordinations in five fields:

(a) Alliance Nationale pour les Sciences de la Vie et de la Santé (Aviesan);

(b) Alliance Nationale de Coordination de la Recherche pour l'éÉnergie (Ancre);

(c) Alliance des Sciences et Technologies du Numérique (Allistene);

(d) Alliance Nationale de Recherche pour l'Environnement (AllEnvi);

(e) Alliance Thématique Nationale des Sciences Humaines et Sociales (Athéna).

This strategy has become a significant factor of transformation in the life of universities, since such alliances have generated new opportunities, especially in relation to a new position of the establishments in the territory, constituting new identities in terms of their mission in face of society's demands. "French universities have thus begun to contour, to differ in fact, if not in law, to show reputations around their strengths ..... Thus, recent laws on university research and autonomy should be understood as the conclusion points of a reform process in the French academic system, not as its inaugural point" (Paradeise, 2012; Musselin & Paradeise, 2008).

Operational HER institutions include, under one or the other of these legal forms, universities, and schools, such as public engineer schools—Polytechnique, etc.; private or semi-private engineer schools—Centrale; Instituts d'Etudes Politiques; Ecole Nationale d'Administration; Business Schools; etc. Companies may be formally involved, for instance, through centers of competitiveness and programs of entrepreneurship and innovation.

The research center is the basic cell of the research system. A research center or laboratory usually associates HE institutions and public research organisations that support it with human resources (researchers, professors enseignants-chercheurs [EC], professeur or Maître de Conférences, engineers, technicians, administrative staff, doctorates, post-doctorates, etc.) and basic funding.

A laboratory can belong to a GdR, a FR, or a IFR, as follows:

(a) GdR: Groupement de recherche, a structure from the CNRS that brings together a scientific community workingin the same thematic area;

(b) FR: Fédération de recherche, grouping several laboratories or teams for the construction of interdisciplinary projects, complementary works, and platform sharing;

(c) IFR: Instituts Fédératifs de recherche, federal research units that explore a common scientific strategy of excellence based on the complementarity of the actors as well as other structuring modalities.

Obviously, the way a laboratory works depends on its size, which may vary from a dozen of people to several hundreds. However, it is possible to say that there is a minimum structure that forms the basis of most of the research laboratories in France, which comprise a director, who is responsible for the laboratory, an administrative officer, research teams, responsible for the coordination of research groups, the laboratory council, where the main decisions of the laboratory scientific orientations and daily life are debated, and occasionally an external scientific council.

[11] Article Law 718-2—In a given territory, which may be academic or inter-academic, based on a shared project, public institutions of HE under the Ministry of HER partners coordinate their training offer and strategy research and transfer of knowledge.

Besides, it is important to mention the National AERES, Law of July 22, 2013, decree of November 2014. The AERES (which muted in 2012 to HCERES) assesses laboratories, teaching departments, and institutions as wholes. It recruits ad hoc evaluation committees that generate reports. Its purpose is to introduce transparency on these entities performance. As far as research centers are concerned, its evaluation is based the following criteria:

(a) production and scientific quality;

(b) influence and academic attractiveness;

(c) interaction with the social, economic and cultural environment (interaction with society);

(d) organization and unit life (teams);

(e) impact on training;

(f) strategy and planning for the next five years.

Such indicators allow institutions to identify, measure, and place each of their dimensions in terms of performance. On the horizon are two points, the valorization of the "brand" and the international position vis-à-vis the classification in the ranking processes (Paradeise, 2012).

Both the evaluation agency—HCERES and the research agency—ANR, contribute progressively to consolidate the funding model based on segmentation and competition among researchers.

Thus, it is possible to visualize an articulated gear between the model of evaluation, financing, and performance, be it in terms of training, research, or innovation.

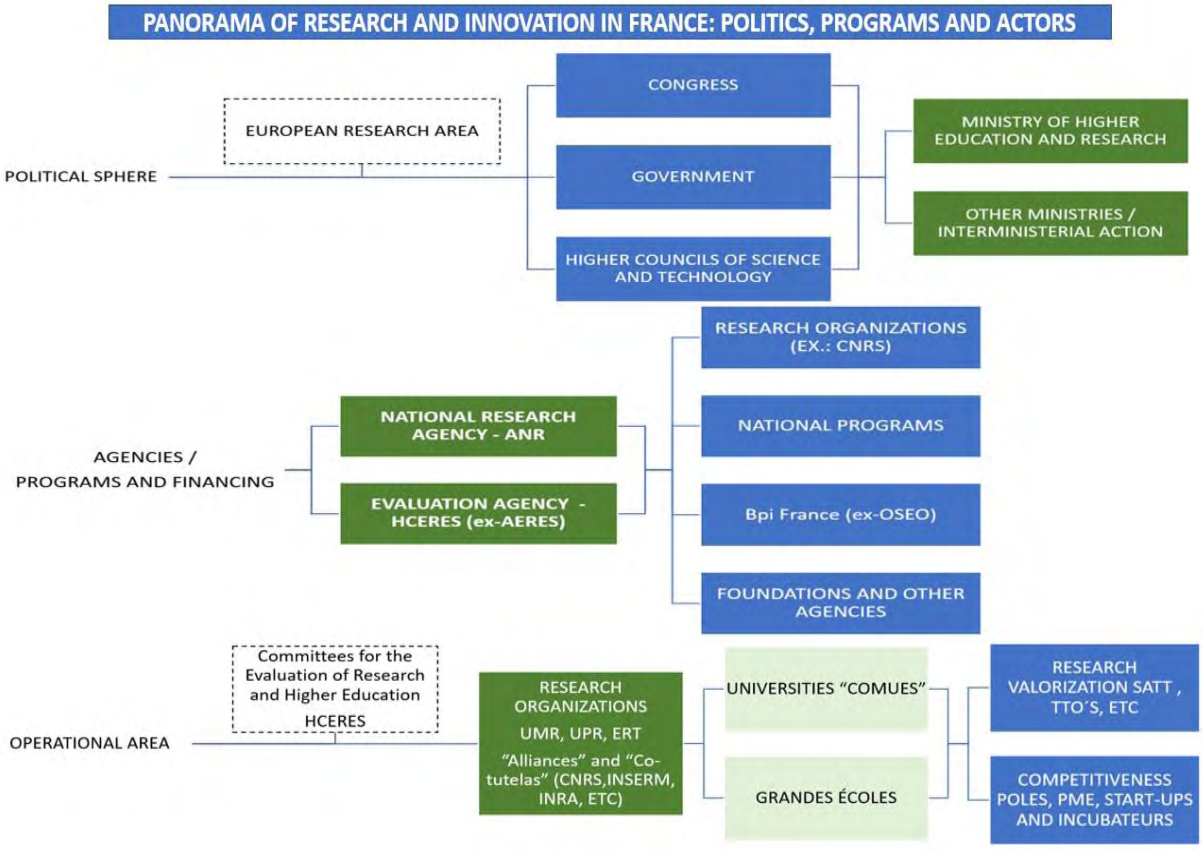

Figure 8. Panorama: Politics, programs, and actors in France (Souce: The author).

According to Paradeise (2012), the changes in the French HE system are thus part of a globalized movement of reorganization of the sector. “The trajectories are different, but the deep ongoing French mutation seems to be derived from a reference model already practiced in several countries” (Paradeise, 2012, p. 9).

Basically, the system described in such reports can be summarized by using the above chart (see Figure 8).

Indeed, this system should not be seen as some harmonious sum of the functions and purposes of each entity in each sphere of the production system.

Conclusions

The mapping of the system helps raising some issues about the articulation of the system, such as the socio-political context that impacted its legal and strategic reordering over the last 20 years and its rationale in the context of a “knowledge society” (Paradeise, 2009).

It can be affirmed that the transformations that were felt in France are part of a broader process within the scope of the globalization of HE. Its main characteristics are: The rationalization of the resources coming from public funds, the restriction of the universal character of such resources implementation in favor of fragmentation, especially by competition in bids, the thematically research direction, either in the proportion by area, the valorization of innovation and projects with potential for technology transfer, the expansion of the university’s role for the social and economic development of the territory, the political appropriation of the university’s role for the sustainability of the planet, the funding associated with results (bibliometrics), the sophistication of evaluation systems and their indicators, encouragement of the system of local, national, and international alliances with the creation of mixed research units, and the implementation of correlated management and governance models.

As a consequence, reform seems to undermine the principle of equality and freedom, the “unfulfilled” principles of modernity, since in its place it proclaims competition and control, leading HE, research, and innovation to an agenda that could be considered “postmodern”[12].

The study showed that current legislative developments have had strong effects and brought to light a narrative that points to the polarization between the fight against a supposedly ineffective model, regulated by the academy, bureaucratic and organized in “fiefdom” versus a competitive, segmented, and organized model from a quasi-market logic.

In this narrative the notion of innovation has become a kind of panacea, where everything associated with the logic of innovation has in itself a positive social dimension in the eyes of the instituted indicators.

In addition, the university’s own role as an agent for promoting equity is being lost on the horizon, as opposed to the need to improve institutional position in the international ranking frameworks.

The university’s mission is multi-dimensional (Paradeise, 2012), in this sense, considering the HE’s function, the hierarchy of importance among research, innovation, training, support for social mobility, support for local development, and culture promotion is senseless. Between the model of competition and the return to a model of “feudal” powers should prevail the university ethically committed to human rights, the preservation of the environment, besides the necessary freedom and inherent in the knowledge production.

[12] One of the most evident features of postmodernity is the mechanisms that lead to the fake of reality. In the case of HE, for example, the strong effects of international ranking systems generate quite questionable conclusions, establishing from criteria that when placed out of context impose through their results the symbolic disqualification of institutions. About the modernity and post-modernity debate (Jameson, 2002).

Thus, each institution should seek its position, looking to the future in order to articulate itself autonomously to the present challenges of democratic societies.

It is necessary to broaden the dialogue between the actors involved with public policies, evaluation criteria and institutions, giving a privileged place to the daily challenges, ambitions, and strategies of each establishment to better direct the ways of financing, and understanding HE as a field in permanent transformation since the specificity and the raw material of its work is man, nature, and its inexhaustible relationship.

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How do We "Know" What Our Students "Know" They "Know"?

Marilee Bresciani Ludvik
San Diego State University, California, USA

With an emphasis on diversifying higher education, responding to the question of how we know that all of our students know what we need for them to know requires educators to include context and culture within our educational inquiry methodologies. A synthesis of literature shares a table of measures that are organized into seven inquiry approaches, all used to understand how students know. Ways to foster students' awareness of their knowing that incorporate considerations of context and culture are proposed as well as challenges of integrating the approaches or lenses through which we evaluate all students' ways of knowing.

Keywords: learning assessment, multiple methods, self-report, behavioural measures, contextual measures, content measures, knowing

Introduction

Discovering what our students know and are able to do is not only a good idea; it is a responsible way to design and deliver education, especially when the emphasis is on understanding how well what we are doing is working for whom. Furthermore, we are required by accreditation and quality assurance agencies and in some cases, state/province agencies, to provide evidence of what our students are able to know and do. In order to close achievement gaps, it is inherent that we understand how all of our students are able to know what we need them to know, so we can improve their experiences. While institutions invest a great deal in discovering how to improve the systems that design, deliver, and evaluate higher education, we continue to be criticized for the value of a degree and our inability to close achievement gaps. As such, this is as good a time as any to step back, reflect, and discern whether the questions we are asking about how and what students know and are able to learn are the ones that will equip us with combating the increasing challenges facing higher education today. This meta-synthesis describes the inquiry approaches we have historically used to discover what students know and are able to do and posits questions and inquiry methods to consider as we work to transform not only our educational design and delivery, but also the ways in which we discover what students know they know.

Background

In 2000, the National Research Council published an informative book about how we understand people learn. Within that book, there were several empirically informed ways to understand how students learn in order to improve learning environments, whether online or in person. The book organized content that

Marilee Bresciani Ludvik, Ph.D., professor, Postsecondary Educational Leadership, San Diego State University.

influenced the learning design and improvement discussions into six primary areas: (a) the role of prior knowledge in learning; (b) plasticity and related issues of early experience upon brain development; (c) learning as an active process; (d) learning for understanding; (e) adaptive expertise; and (f) learning as a time-consuming endeavor (p. 233). The book editors also emphasized the “importance of (understanding) social and cultural contexts, transfer and the conditions for wide application of learning, subject matter uniqueness, assessment to support learning, and (at that time) the new educational technologies” (p. 233).

In 2005, the National Research Council applied many of the discoveries from the 2000 publication in a book that would focus on how students learn science in the classroom. In 2018, the National Research Council again produced a compendium of what we understand about how students learn and called on educators to engage in more explicit assessments that would include an understanding of context and culture. The authors encouraged educators to consider questions paraphrased here as, in order to account for culture and context and to leverage it in the design of learning and development opportunities, how can we invite students to become more transparent about their thinking? What is their process for making meaning? What motivates them to learn and apply that learning in culturally relevant and meaningful ways? How do students know that they know? And how can we learn from that to empower more students to learn? These paraphrased questions are intended to point educators in the direction of what we could be studying over the next decade. Doing so may not only close achievement gaps, it may also return value to a higher education degree.

While the National Academies of Sciences has invested a great deal in sharing what we know about how people learn, the author wanted to explore how that is translating to publish educational research. To say that most educators do not care about discovering the answers to these questions or have not invested themselves in trying to find the answers to these questions may be inaccurate. What is understood is that a simple search conducted in the summer of 2016 of the university library journals (using the search words “education journal”) elicited over 1,957 education journals and 713 books (note that some countries publish their educational journals in single annual reports that share common names, thus counting as an individual journal in this search). All of these journals were filled with research manuscripts seeking to discover what we know about what our students know they know. This would lead one to assume that many are invested in the study of understanding knowing. This peaked the author’s curiosity and intent to understand in what ways we have explored understanding how our students know and more specifically, how our students know they know.

Methodology

In order to explore how we know what our students know they know, a review of 100 randomly selected abstracts from the 1,957 education journals published from 2005-2015 was conducted. In addition, purposeful selection of 12 additional abstracts published in five cognitive neuroscience journals (of which there were 17 available) were reviewed in order to represent another perspective of knowing for educational researchers to investigate and integrate into their work.

To ascertain the inquiry approaches, each abstract and methodology section was examined to identify:

1. How “knowing” was contextualized;
2. How it was measured when those methods, as described in the abstract, were unclear.

These two categorizations were noted on index cards and later grouped them into categories by using the constant comparative method. Once, the draft table of groupings was completed, it was recorded that some commonly used assessment of learning and development measures were missing from these published journals.

So, the author completed two additional steps: First, the analysis six assessment of learning and development websites (listed in the references) that are regularly utilized were added. Second, the measures and contexts from these websites were compared and contrasted with the draft table, adding any additional methodologies that may not have been represented thus far. In addition, some measures being administered in the author’s and other colleagues’ piloted projects, which seek to understand culture and context were included.

Findings

Table 1 synthesizes the results of this analysis into measures that are organized into seven inquiry approaches; all used to understand how students know what they know: (a) biological/neurological/physiological measures that seek to understand how the body knows; (b) behavioral measures that aim to explore how knowing exhibits itself; (c) content measures that investigate evidence of knowledge content; (d) disposition and attitudinal measures that seek to explain students dispositions and motivation towards the process of knowing; (e) self-report measures to invite students’ perspectives of the process of knowing and what is known; (f) contextual measures which seek to explain the context for knowing and not knowing; and (g) process measures which explore the process of students’ awareness in their coming to know what they know. In Table 1, the name of specific instruments was avoided, with the exception of some of the biological, neurological, and physiological measures. Here, the technology was named in order to describe, with more specificity, what is being examined. As you can also see from reading Table 1, some types of measures are used more than once as they can be modified and applied to multiple lenses of inquiry.

Table 1

Types of Measures Grouped by Inquiry Approach

Biological/ Neurological/ Physiological measures	Behavioral measures	Content measures	Disposition/Attitudinal measures	Self-report measures	Contextual measures	Process measures that can be cultural specific
Blood flow in the brain using functional magnetic resonance imaging (fMRIs)	Observation (by instructors, peers, and site supervisors)	Tests (standardized and non-standardized)	Standardized inventories	Surveys	Interviews	Think aloud
Electrical activity in the brain using an electroencephalogram (EEG)	Academic transcript analysis	Quizzes (multiple choice and open-ended)	Role-playing	Questionnaires	Focus groups	Mind maps
Cardio-vascular measures (heart rate, blood pressure)	Scenarios using deception	Case studies	Scenario evaluation	One-minute questions	Environmental studies	Reflective journals/Essays
Skin-conductants	Behavioral adjustment plan	Role-playing	Journal/Essay reflections	Polling	Journal reflections	Reflective portfolios
Saliva swabs	Social media analysis	Situation-based/dilemma-based analysis	Surveys	Standardized inventories	Institutional descriptive data (including institutional type)	Inquiry-driven conversations (individually and in-class)
	External reviews/community partner critique	Class-based and capstone essays and projects (inquiry-based and applied)	Questionnaires		Demographic variable groupings/student descriptors	Interviews

(Table 1 to be continued)

	360 degree evaluations	Portfolios	Case studies		Cultural narratives	Observations
	Calendar categorization/time management calendar	Questionnaires	Students’ ability to make meaning of their learning		Phenomenology	Difficult factors assessment
	Detailed behavioral event interviews	Grades	Instructors’ ability to make meaning of what they are teaching and how they are evaluating students		Ethnography	Detailed behavioral event interviews
		Persistence rates*			Institutional performance indicators	Performance
		Job placement rate*			Student academic readiness data	Calendar categorization/time management calendar/daily planner usage
		Salary earnings*			Student non-cognitive assessed variables	Use of visuals/ images
		Time to degree*			Evaluations of classroom teachers	Vision boards
		Course pass rates			Institutional policies and practices	Inclusion of family or community members
		# of credit hours accumulated*			Promotion/review/& tenure policies/personnel evaluations	Learning journey mapping
		Degree or certificate attainment*			Needs assessment	
		Rubrics			Utilization of student support services	

Notes. The asterisk symbol (*) invites a conversation among educators as to whether these are content measures or contextual measures. While used as content measures in the literature analyzed, they may be more accurately categorized as contextual measures of learning and development.
Measures listed in italics were found in journals published after 2016 and used in pilot collaborative work to explore context and culture.
Note caution in the use of Table 1.

If the reader finds Table 1 to be useful in categorizing inquiry methods for understanding “How all of our students know”, please be sure to note this; you may not want to agree with the way researchers used all of these measures. For instance, how does time-to-degree relate to content learning, particularly in light of the 2018 National Research Council publication that invited us all to be aware that learning is a time-consuming endeavour and that we have a lot more to learn about how context and culture influence all students learning. As such, the author recommends that indicators such as time-to-degree and graduation rates be used as

contextual measures, as opposed to content measures. Nonetheless, Table 1 represents how the measures were used in the publications included in this analysis. In addition, the author recommends that we be very thoughtful about how we use measures and under which lens of inquiry we use them in order to optimize our improvement of the design, delivery, and evaluation of higher education for all students. For example, how does time-to-degree improve our understanding of how students know what they know. If it is lengthy, what does that indicate? If it is within the time-frame desired by many higher education funders, what does that indicate?

Limitations

There are several limitations to this synthesis. First, through random selection, the author may have missed some pertinent measures of knowing. Important measures that are building blocks of identifying ways of knowing may have been inadvertently excluded from the additional purposeful selection of cognitive neuroscience journals. There are other fields that may discuss ways of knowing that would be published in journals that are not identifiable using the limited search criteria that was used. Other researchers may categorize these measures differently based on how they interpreted the abstracts and methodology sections that were included in this synthesis.

This manuscript is missing the details of what we know about how identity groupings and intersecting of identity groupings know what they know. As a profession, we are in the nascent stages of this exploration. There is neurodiversity present within identities and their intersections (Bresciani-Ludvik, 2018). As such, furthering our understanding of knowing how all the students we serve know, so that we can learn how to better serve all students may not be fully reached without our further delving into context and culture. For example, because students who identify as Asian (with the exclusion of those students who identify as of East Asia and Pacific Islanders) are graduating at higher rates than any other social race category, this is not an indicator that these students know what they know and how they know it.

In essence, what you do not see in Table 1 is the answer to these questions, “What do we really know about what students know from the use of these measures and how does what we know influence the design, delivery, and evaluation of student learning and development for all of our students?” The simple answer is that there is not a simple answer. Synthesizing the results from investigating the complex process of learning and development of thousands of individuals into one meaningful performance indicator is extremely challenging. Rather than attempting to answer these questions here, the author recommends that we shift back to investigating the questions inspired by the National Research Council 2018 publication, how can we invite students to become more transparent about their thinking? What is their process for making meaning? What motivates them to learn and apply that learning in culturally relevant and meaningful ways? How do students know that they know? And how can we learn from that to empower more students to learn?

Discussion

If we want to focus on understanding how students know what they know, perhaps we begin by becoming cognizant of what “knowing” means. Merriam Webster’s dictionary defines “knowing” as “having or reflecting knowledge, information, or intelligence; shrewdly and keenly alert: astute (a ‘knowing’ observer); indicating possession of exclusive inside knowledge or information (a ‘knowing’ smile)” (Retrieved August 2, 2016, from http://www.merriam-webster.com/dictionary/knowing). This may explain why, when we examine the published

research on what students know, we discover the emphasis on identifying their ability to demonstrate what they know as defined by content acquisition. There are several content measures listed in Table 1. We also notice the extent that we are seeking to understand the context in which students learn and develop and how culture also plays a role. These approaches and these lines of inquiry make sense to continue to pursue, particularly as it relates to improving the ways in which we design opportunities for students’ learning and development.

There are also a few more measures that may be beneficial to our exploring the context of how students know. These are not new measures; they are simply categorized here as contextual measures. Of importance is:

1. Our ability to understand the implications our institutional policies and practices have on students;
2. The way we hire, review, promote, and reward instructors as well as administrators;
3. The connection of how students view instructors in evaluations compared to their demonstrated content learning;
4. The manner in which students report needing academic and student support services and how they actually use them.

What is being proposed is an intentional combining of all of these ways of inquiring into what students know in order to better understand what we can improve and how we can improve it for each and every student.

Connection Action to Learning and Development Theory

What is lacking in Table 1 is the emphasis on understanding the process of students’ coming to “know” and the process of they make meaning of their learning. Turning toward Shannon Nolan-Arañez and Bresciani-Ludvik’s (2018) interpretation of Marcia Baxter-Magolda’s self-authorship theory, “the internal capacity to construct meaning is related to what Baxter-Magolda (2009; 2014) calls self-authorship. Self-authorship is a form of meta-cognition (a process of) understanding one’s beliefs, relationships, and identity” (Karp & Bork, 2012; Duckworth, Akerman, MacGregor, Salter, & Vorhaus, 2009, p. 101). In self-authoring, students build on this evolving intra-personal perspective by comparing and contrasting what they are learning and making meaning out if it. Nolan-Arañez and Bresciani-Ludvik (2018) reported that the “final stage of self-authorship is interpersonal development which requires students understanding how they want to interact with others. And determine expectations for others in their lives. The cycle of self-authorship builds momentum with every crossroads experience (a point in time) where students decide if they want to move forward with others’ expectations or in a new direction informed by their internal voice … (the meaning making) can expand and contrast based on life’s” experiences and the human reaction to them” (pp. 103-104).

Using Baxter-Magolda’s self-authorship theory as a basis for the importance of connecting students meaning making with meta-cognition or students’ awareness of what they are discovering, we are still left with the question, “How do we know that students know they know?” Meta-cognition has been an expressed interest of some educational researchers. Defined as the “awareness or analysis of one’s own learning or thinking process” (Retrieved August 2, 2016, from http://www.merriam-webster.com/dictionary/metacognitionon), meta-cognition research may be what we are interested in delving further into if we are to significantly improve student learning and development.

In examining meta-cognitive research (Barton, 2004; Elbaz, 1989; Lucariello & Naff, 2016; Olson, Turmo, & Lie, 2001; Zohar & Nemet, 2002), the importance of connecting the content of what is being learned to the instructor’s and student’s ability to make meaning of it remains a resounding point of interest to the improvement of learning and development. Students’ ability to reflect upon and apply their knowledge and

skills is important in their meaning making process. In discovering the relevance of what they have learned as it relates to where they find value and identity means that students engage more fully as active participants of their learning (Astin, 1993; Schlossberg, 1989; Tinto, 1975). A likely result is that students will be considered an academic success, as measured by completion of a degree or certificate (performance indicator). Still, “How do we know they know what they know”, particularly when compared to the evidence of the knowledge that was assessed and the context in which it was provided and the culture in which the student finds meaning?

A more extensive synthesis of meta-cognition research is necessary. For now, the practice of intentionally dissecting meta-cognition allows one to influence the development of awareness in the classroom, particularly when students may be coming from environments where they are looking for just one answer that is “correct” or seeking to only satisfy a rubric analysis. In dissecting meta-cognition, we need to understand what awareness is. Merriam Webster defines the word “aware” as, “knowing that something (such as a situation, condition, or problem) exists**:** feeling, experiencing, or noticing something (such as a sound, sensation, or emotion): knowing and understanding a lot about what is happening in the world or around you” (Retrieved August 2, 2016, from http://www.merriam-webster.com/dictionary/awareness). When the author searched for educational research that investigated, “how aware are students of what they are learning?” It was much more difficult to find research and findings to summarize. What was discovering, however, was fascinating, and it led the author to completely re-design every course taught.

Re-Designing Educating and Evaluating of Learning and Development

Einstein is attributed as saying, “The same kind of thinking that created the problem is not the kind of thinking that can resolve it” (Retrieved September 14, 2010, from http://www.brainyquote.com/quotes/quotes/a/alberteins385842.html). If we keep focusing on evaluating what we think students know, we are not going to create anything different than what we already have discovered. Rather, we needed to shift your thinking away from, “How do I know students know to, how are students aware of what they are learning? How do they integrate what they are learning into what they value, who they are, and who they are becoming? How aware am I of what they need and how do I need to adapt what I know to be in service to what we are co-creating?”

In essence, the shift from “How do I know students know to how aware students of what they know are” places students in the driver seat of the co-creation of the design, delivery, and evaluation of their education. In this educator moves from the primary seat of responsibility for student learning to partnering and co-creating with students along their educational journey. Again to quote Einstein of “I never teach my pupils, I only attempt to provide the conditions in which they can learn” (Retrieved September 14, 2010, from http://www.goodreads.com/quotes/253933-i-never-teach-my-pupils-i-only-attempt-to-provide). If educators are to shift their focus of inquiry, it means breaking students’ “awareness” of their learning into four primary pieces: (a) attention regulation; (b) emotion regulation; (c) cognitive re-appraisal; and (d) self-regulation. Later, the author also discovered that adding compassion and self-compassion into this formula, but for now, we remain focused on meta-cognition skill building.

Within the meta-cognition skill building context, attention regulation (AR), became the first building block. As defined by Lutz, Slagter, Dunne, and Davidson (2008), AR refers to the student’s ability to focus and sustain attention on an intended object. Through attention regulation, an individual is trained to notice when one’s focus is directed to the intended object (e.g., their breath) and to notice when the focus has drifted away

from the intended object (e.g., to thoughts, bodily sensations, or sounds in the environment). Becoming aware of where attention resides is not only important to learning and development (Bresciani-Ludvik, 2016), but also it is important to the process of developing awareness (Goldin & Gross, 2010; Goldin, McRae, Ramel, & Gross, 2008).

Tang and colleagues (2007) compare attention training (such as a working memory training program) and attention state training (such as that designed into the courses in which I teach) and further delineate the differences between the two: “Attention training: (a) trains executive attention networks; (b) requires directed attention and effortful control; (c) targets non-autonomic control systems; (d) produces mental fatigue easily; and (e) training transfers to other cognitive abilities (p. 226). Whereas, “attention state training: (a) produces changes of body-mind state; (b) requires effort control (early stage) and effortless exercise (later); (c) involves the autonomic system; (d) aims at achieving a relaxed and balanced state, and (e) training transfers to cognition, emotion, and social behaviours” (p. 226). Being aware of what kind of attention training we are designing in education appears to be a primary component of fostering greater student success.

Next, came the building block of training emotion regulation (ER). ER as defined by Grolnick, Bridges, and Connell (1996) is the process of harnessing awareness of where attention resides and then initiating, maintaining, and modulating an emotional response. Emotion regulation builds upon attention regulation (Gross, 2002; Gross & Thompson, 2007). This is an important process to design within higher education because emotions play a role in regulating what gets stored and recalled from memory (Hutcherson, Goldin, Ramel, McRae, & Gross, 2008; Kirschbaum, Wolf, May, Wippich, & Hellhammer, 1996; Lang, 1995; Lazarus & Lanier, 1978) as well as play a role in decision-making and the prioritizing of decisions (Loewenstein & Lerner, 2003; Baer et al., 2004; Beilock, 2010; Bergen-Cico et al., 2013; Bravers, Reynolds, & Donaldson, 2003; Brown & Ryan, 2003; Buchheld, Gross-man, & Walach, 2001; Chadwick et al., 2016; Chiesa, Calati, & Serretti, 2011; Cotman & Berchtold, 2002; Cotman, Berchtold, & Christie, 2007; Damasio & Carvalho, 2013; Damasio, Damasio, & Tranel, 2013; Garland, Goldin, Ramel, & Gross, 2009; Hutcherson, Goldin, Ramel, McRae, & Gross, 2008). Furthermore, as Antonio Damasio and his colleagues’ research (Damasio & Carvalho, 2013; A. Damasio, H. Damasio, & Tranel, 2013) suggested, human beings will behave according to what their body wants to do, whether or not the human is aware of it. In essence, based on evolutionary tendencies of survival, the human body will react to environmental stimuli and behave in ways in which the mind is unaware (Habibi & Damasio, 2014). In times of stress, for instance, cognitive processes become known after the body has already acted. This research suggests the importance of training students’ awareness of their emotions, often expressed physiologically in the body, thus empowering students to integrate their emotions into their choices as opposed to being unaware of the role their emotions have in their behaviour.

Furthermore, we also understand that heightened emotion and in particular, stress, can be harmful to students. When students feel stressed (regardless of the reason), their bodies react to the situation they have perceived to be challenging and threatening, which consequently changes the way the brain functions (Lang, 1995). While the stress response has evolutionary benefit, it can also have deleterious effect on higher order thinking, and consequently, academic performance (Cassady, 2004; Kirschbaum, Wolf, May, Wippich, & Hellhammer, 1996; Lazarus & Launier, 1978; Lesch, 2007; Loewenstein & Lerner, 2003).

With emotion regulation training, individuals begin to notice their own emotions, specifically how emotions begin to develop (e.g., stress associated with a feeling of tension) and where emotions are located in one’s body (e.g., stress beginning with a feeling of tension in the abdomen and resonating toward the upper

chest) (Bresciani-Ludvik, 2016). Moreover, when training for emotion regulation, the participant is often instructed to simply pause, breathe, and observe the emotion, without judgment, which can allow an immediate physiological reaction in the body, down regulating the emotion, and up regulating cognitive processes (Bresciani-Ludvik, 2016). This process allows students to become aware of emotions and notice how they may be influencing decisions, the prioritizing of decisions, storage, and recall of memory, and behavior among other things. In this way, emotions are integrated into cognition, allowing for a different way of thinking than existed before; often referred to as cognitive reappraisal.

Cognitive regulation or more often referred to as reappraisal (CR) allows one to examine a situation for what it is, ask several questions about what is fact and interpretation and identify other possibilities (Bresciani-Ludvik, 2016). In CR training, students are invited to describe the sensations they are feeling as they become aware of emotions (Goldin, Ziv, Jazaieri, & Gross, 2012). In cognitive reappraisal, a person becomes aware of the unwelcomed emotion, for example, names the emotion, practices inquiry into it, and then chooses how to act upon that emotion.

Building on CR, we added additional inquiry practices. In essence, determining what is true for the individual and to acknowledge what is true for the individual may not be true for others or to the situation that elicited the emotion can immediately reduce stress and up-regulate analytical reasoning; it becomes more of an integration of emotion into the cognitive processes, rather than an avoiding or suppressing of emotion (Bresciani-Ludvik, 2016). That is, the participant can be with unwelcomed sensations without casting blame for those sensations on oneself or another. This allows the student to re-appraise the emotion in the moment, thus leveraging the usefulness of the emotion if it is helpful to task completion (such as knowing that experiencing stress when learning something new is normal) or determine the stress as a signal to seek appropriate and relevant assistance.

With attention (AR), emotion (ER), and cognitive re-appraisal (CR) regulation training, we posit that the student will move closer to becoming self-regulated. We like to think of this as a movement toward more empowered and consequence-aware choices. Self-regulation has been a challenging concept to define, cultivate, and evaluate (Geldhof, Little, & Hawley, 2012; Geldhof, Little, & Colombo, 2010; Gestsdottir, Urban, Bowers, Lerner, & Lerner, 2011; McClelland, Ponitz, Messersmith, & Tominey, 2010; Vohs & Ciarocco, 2004; Zuberi & Zuberi, 2012). There have been a variety of definitions of self-regulation (Baumeister & Vohs, 2004; Cole, Martin, & Dennis, 2004; Kochanska, Murray, & Harlan, 2000; Rueda, Posner, & Rothbart, 2005; Zelazo & Müller, 2002). For use in this work, the author has adopted McClelland et al.’s (2010) concept of self-regulation as “a multi-dimensional construct that includes the regulation of emotion, cognition, and behaviour” (p. 510).

In Table 2, you will see the design of the AR, ER, and CR curriculum—called “integrative inquiry” (INIQ)—and the usual ways in which it is evaluated. It has been shown to significantly reduce students’ stress and anxiety, increase AR, ER, and CR, as well as increase students’ self-awareness, resilience, compassion (when the compassion component was later added), and self-regulation (Bresciani-Ludvik, 2016).

With the foundation of INIQ training, we are beginning to discover the answers to these questions, “How are students aware of what they are learning?” and “How do they integrate what they are learning into what they value, who they are, and who they are becoming?” The applied evidence to reveal answers to these questions is currently being collected. Finally, the question that remains unanswered with this research is this, “How aware am I of what they need and how I need to adapt what I know to be in service to what we are

co-creating?” The short answer is to immerse oneself as a learner using the same meta-cognitive skill building process as the one the students are invited into. This is where the compassion and self-compassion pieces play an integral role.

Table 2

INIQ Structure, Outcomes, and Measures

Category	Goals	INIQ/OSRT practices	Outcomes	Assessment measures/tools
Attention regulation	Attention management/awareness; Awareness of awareness.	Focused breathing; Meta-attention; Open attention; Mindful meditation; Mindful listening.	Increased attention regulation	FFMQ; daily journaling; daily multiple choice check-in question; focus group interview; behavioral event interview.
Attention regulation; emotion regulation	Attention management/awareness; Emotional awareness; Compassion.	Focused breathing; Meta-attention; Open attention; Mindful meditation; Mindful listening; Empathic Listening Focused movement; Body scan; Movement in nature; Reflective journaling	Increased emotion regulation	FFMQ; BAI; PSS; daily Journaling; daily multiple choice check-in question; Beck; PSS; focus group interview; behavioral event interview.
Cognitive reappraisal	Attention management/awareness; Emotional awareness; Self-awareness; Compassion; Conscious choice-making.	Naming emotions; Cognitive reappraisal; Task-switching; Just Like Me; Unwelcomed Emotions Re-appraisal; Loving Kindness Meditation; Resilience training	Increased cognitive re-appraisal	FFMQ; Daily Journaling; Daily multiple choice check-in question; Beck; PSS; focus group interview; behavioral event interview.
Self-regulation	Attention management/awareness; Emotional awareness; Self-awareness; Conscious choice-making; Adaptable leadership.	Previous practices continued, while adding more reflective Journaling; Alignment of experience with personal and professional goals and values; Insight meditation; Creative expression; Well-being exploration	Increased self-regulation	Daily Journaling; daily multiple choice check-in question; focus group interview; pre-and post-exam assessment; final exam performance with cardiovascular measures; behavioral event interview.

Conclusions

This synthesis of literature began with exploring the National Research Council’s proposed questions for educational researchers. We examined ways we are measuring what students know and explored two areas where we may be able to improve our inquiry methodology. First, we can consider integrating the various lenses/approaches (see Table 1), in which we measure what students know, so as to get a more accurate picture of how students know what they know, and therefore, get a better understanding of how we can improve the design, delivery, and evaluation of higher education, so that all students can succeed. Second, we can strengthen the process measures that help us understand “How we know students know what they know”. To this end, a training methodology, called INIQ, was offered as one option in which students and instructors can begin to foster awareness of their thoughts, feelings, and actions.

In closing, we offer one more interview protocol (see Table 3), that may help improve our process and behavioural measures of knowing. In this protocol, it is important that the interviewer be trained as an astute observer and sensor of the student, so as to gauge the direction of the follow-up questions. We are currently piloting this interview protocol and it will likely go through several iterations. We welcome your letting us know what you discover in using it and also how you might improve it.

If we are to create something different (e.g., decolonization) in the next decade of postsecondary education, we must break apart conceptual language like “knowing” and “critical thinking” and see what we can discover about, “How our students are aware of what they are learning and how they integrate what they are learning into what they value, who they are, and who they are becoming” while in partnership (e.g., a co-creation) with the students we serve. We need to train students into awareness of their thoughts and actions as well as ourselves. And it is likely that we will need to use different measures of learning and development than the ones that are currently in high volume use or at the very least, use multiple measures representing a variety of inquiry approaches. Perhaps more importantly, it is time to actively and intentionally train and then invite students into their own evaluation of their learning and development and meaning-making journeys. They might help us discover whether four years enough for students to feel ready for the job market is. Then again, maybe they will help us discover that four years is more than enough. Either way, they will likely help us understand how time is a context variable in the measurement of learning and development and an important one at that.

Table 3

INIQ Behavioral Event Interview

1. What is motivating you to engage in the INIQ practices?
How do you know you are motivated to practice?
What do you feel in your body?
Describe the location of those sensations; the intensity; the qualities…
How do you know you are feeling what you are feeling?
Do you hear it, see it, and feel it? Can you describe it?
What emotions are you noticing when you notice these bodily sensations?
How do you know that you are feeling this?
Do you hear it, see it, and feel it?
Describe the qualities, intensity, and sensation of the feeling.
What are you thinking when you notice these sensations?
How do you know what you are thinking?
Do you hear it, see it, and feel it?
Describe the qualities, intensity, and sensation of the thought.
Do you see images or hear sounds associate with these thoughts? If so, can you describe the color, tone, qualities, and intensity of these sounds/images?
2. Are you noticing any resistance to engaging in the practices?
How do you know you are experiencing resistance?
What do you feel in your body?
Describe the location of those sensations; the intensity; the qualities …
How do you know you are feeling what you are feeling?
Do you hear it, see it, and feel it? Can you describe it?
What emotions are you noticing when you notice these bodily sensations?
How do you know that you are feeling this?
Do you hear it, see it, and feel it?
Describe the qualities, intensity, and sensation of the feeling.
What are you thinking when you notice these sensations?
How do you know what you are thinking?
Do you hear it, see it, and feel it?
Describe the qualities, intensity, and sensation of the thought.
Do you see images or hear sounds associate with these thoughts? If so, can you describe the color, tone, qualities, and intensity of these sounds/images?
What are you noticing about your stress-level after engaging in the INIQ practices?
How do you know this is your experience?
What do you feel in your body?
Describe the location of those sensations; the intensity; the qualities …
How do you know you are feeling what you are feeling?
Do you hear it, see it, and feel it? Can you describe it?

What emotions are you noticing when you notice these bodily sensations?
How do you know that you are feeling this?
Do you hear it, see it, and feel it?
Describe the qualities, intensity, and sensation of the feeling.
What are you thinking when you notice these sensations?
How do you know what you are thinking?
Do you hear it, see it, and feel it?
Describe the qualities, intensity, and sensation of the thought.
Do you see images or hear sounds associate with these thoughts? If so, can you describe the color, tone, qualities, and intensity of these sounds/images?
What are you noticing about your options for choice around the stress?
How do you know these are options?
Do you hear it, see it, and feel it? Can you describe it
For example, are you noticing whether the stressor is true or is it a perception?
Are you noticing whether you can choose another way to perceive the stressor?
Are you noticing that you can ask for help to address the stressor?
If so, do you know what kind of help to ask for and where to go for help?
How do you know?
Do you hear it, see it, and feel it? Can you describe it?
What are you noticing about your own self-judgment or self-talk when stress arises?
How compassionate do you feel towards yourself or others when you notice stress arising?
What else would you like to share about using these INIQ practices or what you are discovering from them that I didn't already ask you about?

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Students' Perception of Democratic Practices and Its Implication for Nigerian Educational System

Amatari Veronica Odiri
Niger Delta University, Bayelsa, Nigeria

Nigerian society has being on uninterrupted democratic rule since 1999. It is an admitted fact that there is an intimate relationship between democracy and education. The sinew of democracy depends upon the character and intelligence of its citizenry; and the level of democratic perceptiveness in the minds of the people is dependent on the type of democracy delivered to its citizenry. The aim of this paper, therefore, is to examine the perception of democratic practices obtainable in Nigeria by students of the senior secondary sector in the educational system in Bayelsa State of Nigeria. A descriptive survey design was adopted. A sample of 200 students responded to the self-developed and validated questionnaire. Data collected were analysed by using descriptive statistic (mean and percentage) and *t*-test statistical technique. The finding shows that students foster high perceptivity to the type of democracy practiced in Nigeria. This paper contends that the looming threat to democratic rule in Nigeria *x*-rays the educational system that is literally dysfunctional. It recommends the promotion of institutionalized democracy that will bring about an overhaul in the kind of education delivered to the younger generation.

Keywords: political participation, democratic values, social learning, secondary school education, perception

Introduction

Students interact carefully with their environments according to their ability to organize information. The process through which the information from the outside environment is selected, received, organized, and interpreted to make it meaningful and which invariably influences their decisions or actions is the issue of perception. Democracy, which is universally defined as the government of the people by and for the people (Abraham Lincoln in his *Gettysburg Speech* in 1863) is derived from two Greek words: "demos" and "kratos". "Demos" means the common people and "Kratos" means rule. This physiologically defined democracy as the rule of the common people. Essentially, it is a system of government in which the people are in charge. Its major features include:

1. Elected representative. The final decision making power rests with those elected by the people;

2. Civil liberties. It upholds basic individual rights and liberties such as freedom of speech, freedom of expression, etc.;

3. Rule of law. It should rule within the limits set by constitutional law and citizen rights;

4. Independent judiciary. It assures equality before the law for all citizens in every sphere of life like political, social, and economic;

Amatari Veronica Odiri, Ph.D., lecturer, Department of Educational Foundations, Faculty of Education, Niger Delta University.

5. Representative elections. It must be based on a free and fair election where each adult citizen must have one vote and each vote must have one value.

The tapping and development of the citizenry intellectual, affective, and psychomotor capacities basically take place within the educational system of a nation. Education can be generally said to be a process of imparting knowledge, skills, value, and orientations to enable individual to develop their potentials to the fullest and in turn contribute their best to the development of their family, community, nation, and the global society. Education equips an individual not only with the ability to read and write which are very critical skills, but also with life-skills which include competences for economic survival, soft skills for excellent interpersonal relations, and sense of civic responsibility, so as to participate effectively both as follower and leader (as the case may be) in societal governance. Education comes in various forms—informal (which takes place in the private settings), non-formal, and adult (which happens out of school but fairly organized) and formal (which takes place in schools formally recognized and accredited by government).

Nigeria's philosophy of education is based on the following set of beliefs:

1. Education is an instrument for national development and social change:

2. Education is vital for the promotion of a progressive and united Nigeria:

3. Education maximizes the creative potentials and skills of the individual for self-fulfillment and general development of the society:

4. Education is compulsory and a right of every Nigerian irrespective of gender, social status, religion, colour, ethnic background, and any peculiar individual challenges;

5. Education is to be qualitative, comprehensive, functional, and relevant to the needs of the society.

The five main national goals of Nigeria as stated in the constitution of the Federal Republic of Nigeria are the building of: (a) a free and democratic society; (b) a just and egalitarian society; (c) a united, strong, and self-reliant nation; (d) a great and dynamic economy; and (e) a land full of bright opportunities for all citizens.

Thorough perusal of the national goals of the Nigerian society, it can simply be deduced that these goals are premised on democratic principles. Commitment to democratic practices, such as political participation, human rights, access to justice, a good education and improved quality of life, a healthy environment and personal security enhance democracy as a system of government to flourish and deliver on promises. Whilst its citizens must be informed, engaged, empowered, and assertive. This is the synergy between democracy and education.

Literature Review

In modern democracy, education is a major key element. Education and democracy are intrinsically linked. There is a close relationship between democracy and education. Education is a prerequisite for the survival and success of democracy. The sinew of democracy depends on the character and intelligence of all its citizens and it takes an educated citizenry to understand and abide by the tenets of democracy. Thus, the integral and reciprocal relationship between democracy and education cannot be overemphasized. According to Bawa (2019), in a democracy education is given primacy, for it is prerequisite for the survival and success of the former and similarly, education fosters a democratic temper in the minds of people. For Hytten (2017), democracy is more than a political system or process; it is also a way of life that requires certain habits and dispositions of citizens, including the need to balance individual rights with commitments and responsibilities toward others. The school has the vital role in cultivating in students the habits and dispositions of citizenship

and democratic values like liberty, equality, fraternity, justice, dignity of individual cooperation, sharing of responsibility, etc., and is applied to education to make it more effective, meaningful, relevant, and useful.

The school as an educational institution mirrors the societal values, beliefs, and practices. A society that upholds the tenets of democracy in the true sense teaches and produces such tenets in the products of the school. However, except deliberate, conscientious efforts, and commitment are made towards an explicit and purposeful process of teaching and promoting the development of democratic knowledge, skills, values, and practices among the participants (students) of the various institutions of education, the students' learning may be restricted to what they do observe in their immediate environment—the social environment.

This study is predicated on the social learning theory of Bandura (1989). According to Bandura (1989), considerable evidence exists that learning occurs through observing others, even when the observer does not reproduce the model's responses during acquisition, and therefore, receives no direct reinforcement. It is a learning theory which focuses on the learning that occurs within a social context. For Bandura, social cognitive learning means that the information one processes from observing other people, things, and events influence the way we act. The outside environment is where a person can observe an action, understand its consequences and become motivated to respect and adopt it. Students in all cultures learn and develop by observing experienced people engaged in culturally important activities. Observational learning has particular classroom relevance, because children do not do just what adults tell them to do, but rather what they see adults do. If students witness undesirable behavior that either is reinforced or goes unpunished, undesirable student behavior may result, the reverse also is true.

Relatively, learning of democratic values and practices; anchored on society like Nigeria which has been practicing uninterrupted democratic rule since 1999, but is seemingly scourged with undemocratic principles and practices, and more so, when deliberate teachings and transmission of democratic values in schools is overtly absent, the resultant effect could be a monumental threat to democracy and education. The political elites who are the drivers of our democratic governance are far-fetched from true tenet practice of democracy and which is evident in their unbridled values and actions. Ajayi (2015) argued that elections and democratic practice in the fourth republic are characterized by electoral malpractice, political intolerance, economic mismanagement, using political office as gateway to personal enrichment, political thuggery, lack of intra party democracy, insecurity, manipulation of religion, and ethnicity to achieve selfish political ambitions and other countless misdemeanors were order of the day. These are the same set of people that the younger citizenry looks up to and this may likely distort their perception of what true democratic practices are. The democratic practices surveyed in the study included:

1. Political participation by the citizens. The opportunity to participate in an authoritative decision making is opened to all who are willing and interested to share. It supposedly involves high level of political consciousness and activism of the masses. It is a system of representation and electoral system that is based on the principle of one man, one vote and one vote, and one value.

2. Access to justice. An independent judiciary is an important component of a true democratic system of government. Promotion of rule of law at all levels ensures equal access to justice to all. When an individual has access to courts then his fundamental rights can be enforced. Accesses to justice also imply access to social and distribute justice. Okogbule (2015) reported that access to justice simply refers to the substantive and procedural mechanisms existing in any particular society designed to ensure that citizens have the opportunity of seeking redress for the violation of their legal rights within that legal system. It focuses on the existing rules

and procedures to be used by citizens to approach the courts for the determination of their civil rights and obligations.

4. Human rights. They are basic rights and freedoms that belong to every person in the world, from birth until death. They apply regardless of where one comes from, what he/she believes or what choice of life is made. These basic rights are based on shared value, like dignity, fairness, equality, respect, and freedom. The entrenchment of human rights provisions in Nigeria constitutions was aimed at creating a society which protects political freedom as well as social and economic well-being of Nigerians. National Action Plan for the Promotion and Protection of Human rights in Nigeria (2006) defined these rights into: civil and political rights; life; dignity of human person; personal liberty; fair hearing; private & family life; freedom of thought, conscience, & religion (Federal Republic of Nigeria [FRN], 2006).

5. Improved quality of life. Democracy plays a vital role in promoting sustainable development and increasing standard of living of citizens. It is generally accepted that improving the quality of life should be the most important component of a successful democracy. Indicators of quality life include public safety, health, and infrastructures, such as available public utilities, housing, and education for all (EFA), economic environment, such as employment rate, per capita income, percentage living below poverty rate, and healthy environment.

The aim of this study therefore is to examine senior secondary school students' perception of democratic practices in Nigeria and its implications for the Nigerian educational system. The study is guided by three research questions and two hypotheses.

Research Questions

1. What is the level of students' perception of democracy as a system of government?
2. What is the perception level of students about democratic practices (citizen's political participation, access to justice, human right, and improved quality of life) in Nigeria?
3. How do students perceive the features of democracy in Nigeria?

Hypotheses

1. There is no significant difference in the perception of democratic practices between students in the urban and rural schools;
2. There is no significant difference in the perception of democratic practices between students in private and public.

Methods

A descriptive survey design was adopted for this study. A sample of 200 students from senior secondary school, classes II and III in Bayelsa State, Nigerian was selected through the disproportionate stratified random sampling technique. The choice of students for the study is significant. For the continuity of democratic rule in the next generation, the younger generation should understand democratic ideals and behave democratically. A self-developed and validated questionnaire tagged "Students' Perception of Democracy Questionnaire" was the instrument of data collection for this study. Section A gives details of the bio data of respondents, while Section B is divided into sub-sections: Section A has 10 item-statements on students' perception of democracy. Section B has a total of 36 item-statements on selected democratic practices in Nigeria: eight items on political participation by citizens; nine items on access to justice; 10 items on human rights; and nine items on improved

quality of life. The students responded to these items by using the Likert scale response format of strongly agree to strongly disagree. Section C outlined the features of democracy in Nigeria and students responded to the 15 item-statements by using the alternate response format of True/False. A reliability coefficient of 0.63 was obtained for the instrument. Descriptive statistics (mean, frequency count/percentage) and *t*-test statistical technique were adopted to analyze data.

Table 1

Descriptive Statistics of Students' Perception of Democracy

	SA	A	D	SD	*M*	*S*
1. Democratic rule is presently practice in Nigeria.	64(32%)	99(50%)	23(12%)	13(7%)	3.06	0.86
2. Democracy is synonymous with majority rule.	55(28%)	109(55%)	21(11%)	6(3%)	2.97	0.95
3. Democracy as a form of government is not associated with good governance.	31(16%)	55(28%)	69(35%)	42(21%)	2.34	1.02
4. Democracy is a representation system of government.	74 (37%)	113(57%)	11(6%)	-	3.28	0.66
5. Democracy is a system of rule of law.	74(37%)	92(46%)	25(13%)	6(3%)	3.14	0.85
6. It is a system of government that recognized individual rights.	80(40%)	86(43%)	23(12%)	7(4%)	3.15	0.90
7. It is the active participation of the people as citizens in politics and civic life.	73(37%)	93(47%)	21(11%)	5(3%)	3.09	0.96
8. It is a process by which people select and control their representatives.	71(36%)	69(35%)	41(21%)	16(8%)	2.94	1.00
9. Election gives an electorate the sovereign power to decide who will govern.	109(55%)	61(31%)	21(11%)	9(5%)	3.35	0.84
10. It is associated with one vote, one value.	83((42%)	89(45%)	10(5%)	10(5%)	3.14	1.00

Notes. SA = Strongly agree; A = Agree; D = Disagree; SD = Strongly disagree; *M* = Mean; and *S* = Standard deviation.

Table 2

Descriptive Statistics of Political Participation of Citizens

	SA	A	D	SD	*M*	*S*
1. Only the politicians are actively involved in politics in Nigeria.	79(40%)	72(36%)	30(15%)	18(9%)	3.05	0.97
2. Participation in the election process attracts money inducement.	86(43%)	78(39%)	18(9%)	16(8&)	3.15	0.95
3. There is low level of political consciousness and activism of the Nigerian masses.	89(45%)	54(27%)	36(18%)	16(8%)	2.85	0.98
4. Many Nigerians put up indifferent attitude towards elections.	86(43%)	87(44%)	13(7%)	9(5%)	3.20	0.92
5. No public disagreement with the politician's conduct.	39(20%)	66(33%)	55(28%)	33(17%)	2.48	1.08
6. Politicians develop deliberate decisions and campaign based on issues for national interest.	77(39%)	66(33%)	30(15%)	21(11%)	2.93	1.10
7. Majority of the citizens mortgage their rights and future with a token of money.	93(47%)	64(32%)	27(14%)	8(4%)	3.13	1.05
8. Election is associated with one man, one vote.	79(40%)	67(34%)	15(8%)	34(17%)	2.90	1.17

Table 3

Descriptive Statistics on Access to Justice

	SA	A	D	SD	*M*	S
1. Nigerians exercise the right to appear in court with ease.	45(23%)	95(48%)	39(20%)	17(9%)	2.80	0.95
2. Nigerians have access to legal advice/help/information for those who cannot offer it.	45(23%)	80(40%)	39(20%)	33(17%)	2.65	1.04
3. The legal system operates under limitations and inadequacies.	43(22%)	85(43%)	38(19%)	28(14%)	2.65	1.05
4. The legal system operates by the fairness principle for societal stability.	38(19%)	71(36%)	56(28%)	28(14%)	2.52	1.06
5. There is deep commitment by leadership to justice for the citizens.	45(23%)	68(34%)	46(23%)	34(17%)	2.55	1.11

(Table 3 to be continued)

6. Access to justice in times of crisis (armed conflict).	39(20%)	74(37%)	53(27%)	30(15%)	2.57	1.02
7. Access to justice and compensation for violation of law.	49(25%)	81(42%)	45(23%)	23(12%)	2.76	1.02
8. Access to environment justice.	45(23%)	94(47%)	45(18%)	19(10%)	2.76	1.98
9. Access to justice for victims of torture (e.g., rape).	83(42%)	58(29%)	25(13%)	31(15%)	2.96	1.13

Table 4

Descriptive Statistics on Human Rights

	SA	A	D	SD	*M*	*S*
1. Rights of Nigerians are guaranteed by the legal system.	64(32%)	87(44%)	26(13%)	18(8%)	2.49	1.04
2. The rule of law protects the rights of citizens.	90(45%)	85(43%)	13(7%)	10(5%)	3.25	0.86
3. All citizens are equal under the law to fight for his/her right.	114(57%)	48(24%)	22(11%)	12(6%)	3.28	1.01
4. The poor in the society has little or no power.	66(33%)	62(31%)	29(15%)	40(20%)	2.74	1.16
5. Every citizen has certain basic rights that the state cannot take away from them.	105(53%)	65(33%)	16(8%)	13(7%)	3.30	0.90
6. Everyone has right to freedom of speech.	115(58%)	53(27%)	20(10%)	10(5%)	3.34	0.92
7. Everyone has right to association.	109(55%)	72(36%)	12(6%)	6(3%)	3.41	0.77
8. Everyone has right to their own beliefs of their own choice.	119(60%)	67(34%)	8(4%)	6(3%)	3.49	0.71
9. Everyone has right to assemble and protest government actions.	74(37%)	66(33%)	37(19%)	20(10%)	2.94	1.04
10. Everyone has obligation to exercise their rights peacefully with respect for law and the rights of others.	102(51%)	71(36%)	15(8%)	8(4%)	3.29	0.91

Table 5

Descriptive Statistics on Improved Quality of Life

	SA	A	D	SD	*M*	*S*
1. The average Nigerian lacks the resources to afford the basic necessity of life such as education and medical facility.	80(40%)	81(41%)	26(13%)	12(6%)	3.13	0.89
2. As a result of the state of poverty, many Nigerians see election process as an opportunity to demand from the office seeker a piece of the national cake (money).	110(55%)	73(36%)	10(5%)	6(3%)	3.41	0.80
3. Democracy in Nigeria represents the government of the wealthy by the wealthy and for the wealthy.	89(45%)	56(28%)	27(14%)	27(3%)	3.02	1.08
4. The rich in power remains power making the poor poorer.	110(55%)	50(25%)	19(10%)	19(10%)	3.23	1.03
5. Democracy is characterized by declining economic power of the citizens.	44(22%)	80(40%)	55(28%)	14(7%)	2.70	1.00
6. Majority of Nigerians are in abject poverty.	116(58%)	51(26%)	16(8%)	15(3%)	3.32	0.97
7. Practice of democracy in Nigeria has widened the gap between the rich and poor.	11(6%)	16(8%)	73(37%)	96(48%)	3.23	0.95
8. The standard of living of citizens is very low.	106(53%)	63(32%)	18(9%)	10(5%)	3.29	0.93
9. Democracy has widened the gap between those who have access to power and public funds and those who do not.	83(42%)	79(40%)	20(10%)	16(8%)	3.12	0.95

Table 6

Descriptive Statistics of Features of Democracy in Nigeria

Democratic practice in Nigeria is characterized by:	True	False	*M*	*S*
1. Election is often dominated by irregularities.	151(75%)	46(23%)	1.74	0.47
2. Low level of political consciousness and activism of the Nigerian masses.	116(58%)	79(40%)	1.55	0.54
3. Dividends of the democracy are accessible and enjoyed by the citizens.	45(48%)	99(50%)	1.45	0.56
4. Electoral malpractices/rigging.	169(85%)	26(13%)	1.92	0.44
5. Political thuggery/violence.	164(82%)	34(17%)	1.81	0.41
6. Lack of internal party democracy.	151(76%)	43(22%)	1.83	0.41

(Table 6 to be continued)

7. Insecurity.	158(79%)	38(19%)	1.77	0.46
8. Manipulation of religion and ethnicity to achieve selfish political ambitions.	160(80%)	38(19%)	1.79	0.46
9. Leader's personal interest against national interest.	161(81%)	37(19%)	1.79	0.42
10. Using political office as gateway to personal enrichment.	163(82%)	30(15%)	1.78	0.49
11. Impoverishment has become a prominent feature of democracy.	140(82%)	54(27%)	1.67	0.53
12. Vote buying.	170(85%)	27(14%)	1.83	0.41
13. Democracy is marked by high card of corruption in all spheres of our national life.	159(80%)	35(18%)	1.75	0.41
14. Ballot box snatching.	161(89%)	35(18%)	1.78	0.45
15. Security agency (police and army) aid electoral malpractices during election.	167(84%)	30(15%)	1.82	0.42

Table 7

Independent T-Test Statistics on School Type and Perception of Democratic Practices

School type	*N*	*M*	Standard deviation	Std. error	*DF*	*t*-value	Sig. level
Public	100	26.21	3.52	0.35	198	-0.39	0.969*
Private	100	26.23	3.76	0.37			

Note. S*: Not significant at 0.05 alpha level.

Table 8

Independent T-Test Statistics on School Location and Perception of Democratic Practices

Location	*N*	*M*	Standard deviation	Std. error	*DF*	*t*-value	Sig. level
Urban	100	26.81	2.69	0.26	198	2.32	0.021*
Rural	100	25.63	4.31	0.43			

Note. S*: Statistical significance at 0.05 alpha level.

Discussion of Findings

Findings on Table 1 show that the students have clear understanding of the concept of democracy. Eighty-three percent, 94%, 83%, 83%, 84%, 86%, and 87% of the students comprehend that democracy is synonymous with majority rule, a representation system of government; a system of rule of law; a system that recognizes individual rights; a system that fosters active participation of citizens in politics and civic life; a system that is based on election through the electorate sovereign power to decide who will govern; and a system that is associated with one note, one value, respectively. However, while 56% of the students disagreed with the statement that democracy as a form of government is not associated with good governance; and 44% agreed with the statement. This shows no clear cut opinion of the students on this issue. This could be attributed to the reality on ground where the democracy experienced by the students is not associated with good governance. Ajayi and Ojo (2014) posited that although democracy may not be strange to an overwhelming percentage of Nigerians, what may be strange to them is the brand of democracy that invests, first and foremost in human and material resources for the purpose of political stability, economic viability, scientific advancement, technological breakthrough, educational development, and life-enhancing social services. The above statement is underscored by the students' responses on democratic practices in Nigeria. On political participation by the citizens, 76% agreed that only the politicians have the monopoly in active participation; 82% responded that election participation is money induced; 87% for election apathy; 63% for low level of political

consciousness and activism of the masses; and 79% agreed that many of the Nigerian citizens mortgage their rights and future with a token of money. These are about the many challenges and problems threatening democracy in Nigeria on one hand. On the other hand, because there is no explicit and deliberate teachings and impartation of true democratic values within our educational institutions, most often the students' understanding and learning of tenets of democracy is basically dependent on what they observe the political elites and gladiators behave and do.

On access to justice, greater percent of the students agreed that Nigerians exercise the right to appear in court with ease; they have access to legal help; but the legal system operates under limitations and inadequacies. This is not surprising because evidences and individual's experiences abound about tales of prolonged court cases, justice denial, crowded and pending cases in court; thousands of citizens in prisons awaiting trials but had spent more than one or more years waiting.

The range of 70% to 94% of the students responded positively and affirmed that citizens are given opportunities and freedom to exercise their rights peacefully with respect for law and the rights of others. Pertaining to improved quality of life as a democratic practice, the students "responses indicate that democracy has not yet impacted positively on the living standard of the masses". Eighty percent agreed that the average Nigerian lacks the resources to afford basic necessity of life, such as education and medical facility. Ninety-one percent agreed that as a result of the state of abject poverty in Nigeria, many see election as a making money event. Seventy-three percent agreed that democracy in Nigeria represents the government of the wealthy by the wealthy and for the wealthy. Eighty percent responded that democracy has widened the gap between those who have access to power and public funds and those who do not. However, 85% disagreed that the practice of democracy in Nigeria has widened the gap between the rich and the poor.

The significant greater percentage of the students agreed that features of democracy in Nigeria include election irregularities, low level of political activism by the masses, electoral malpractices/rigging, political thuggery/violence, lack of internal party democracy, insecurity, vote buying, ballot box snatching, electoral malpractices of security agency, etc. If actually democratic values, practices, attitudes, and skills are to be taught in school and pass to the younger generations through school, and the same school is supposedly a reflection of what the society stands for, there is a pending dilemma that is a threat to the operating educational system in Nigeria.

Table 7 shows that students' perception of democratic practices in Nigeria does not differ on the basis of school type ($t(198) = -0.39$, $p = 0.96$). The students in private and public schools have similar perception of democracy as practiced in Nigeria. This can easily be explained on the fact that all students are exposed to the same learning experiences through observing the behavior and attitudes of drivers of our democracy. However, there is a significant difference in the perception of democratic practices between students in the urban and rural schools ($t(198) = 2.319$, $p = 0.02$). With a higher mean, finding shows that the students in the metropolis have higher level of democratic perceptiveness than those in the rural areas. It is a known fact that the intrigue and machination of governance are often play out in the cities. Many of these politicians neglect their constituencies, but rather reside in the urban reserved residential areas.

The students' perception of what democracy is based on how democracy is being practiced in Nigeria is a cause for concern. The implication is that the educational system is building up future leaders of tomorrow that are not prepared for true democratic values and practices. The reality is that Nigeria as far as the practice and delivery of dividends of liberal democracy is concerned, is yet a cripple that can barely stand let alone walk or

run. The story is not different within the institutions that provide education to our teeming younger generation. The democratic values like liberty, equality, fraternity justice, dignity of individual, and co-operation, sharing of responsibility that should be applied to education to make educational system more effective, meaningful, relevant, and useful are absent from the content what is transmitted to the future leaders of tomorrow, the students. The development within the young of the attitudes and disposition necessary to the continuous and progressive life of the Nigerian society may be threatened.

Recommendations

Democracy should be deeply rooted and institutionalized in the country. The educational system should be overhauled. The curriculum should be restructured to accommodate the ideals and practices of true democracy. The need for political education to enlighten the citizenry on democratic ethos in order to create a social democratic environment that is sensitive to the dictates and principles of true democracy. Players and actors of governance should be made to be accountable for their actions. Accountability fosters a sense of duty and responsibility rather than the pursuit of self interest they are used to.

Conclusion

This study has attempted to look at the synergy between democracy and education. In democracy, education is given primacy. However, when the learning of democratic abilities, skills, values, ideals, and principles by the younger citizenry is done majorly outside the four walls of the school, and more often by observing the actors of our democracy; its implication on the educational system could be alarming. This paper contends that the looming threat to democratic rule in Nigeria *x*-rays the educational system that is literally dysfunctional.

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