

Innovation for Education values with rising complexities

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Abstract

Education in the digital age, while thriving through the 21st century, pose a unique set of challenges. The rising inequalities, regional imbalances, requires the intervention to tweak into the traditional formats of learning and teaching, in order to ensure learners are fully engaged, drive their learning and at same time achieve the overall learning objectives for interconnected global challenges. It edge past the realm of empathetic learning and raise the awareness for developing an innovative approach towards the understanding of interconnectedness of economic, social and environmental issues grappling around the world.

A knowledge sharing platform among practitioners, students, researchers and policy makers to exchange their views and understand the aspect of sustainability and sustainable development may help to develop the understanding around the critical issues. The extracts from the platform would help to expand the knowledge on the subjects and thematic areas of sustainability and sustainable development and help to exchange best examples and policies being implemented in one part of the world to another. The data thus retrieved from extracts would be evaluated across to understand the online behavior of youth. This would help to map the online information with SDG based indicators and develop sustainability based programmes. The values against which the data would be assessed may range from empathy, compassion, inquiry based learning, identity, and how they are directly or indirectly related to cognitive dissonance and it's attributes. This would let us understand how the compartmentalization of thoughts may be improved over the period of time. The mapping would help to analyze the data against various enablers of education. This would open gateways to explore new avenues of education delivery and understand the interconnected complex issues in the world. The parameters of empathy, compassion, cognitive dissonance, identity and critical inquiry can be found for correlation with environment change, disaster risk reduction, social services and community resilience. The matrix thus developed would help to understand the regional imbalances with regard to cognitive development in context to social, economic and environmental elements. This would help to build capacity on generating emphathetic learning on binaries of peace and sustainable development. The regional imbalances would let us develop the benchmarks and revise, evaluate them over the period of time. The design of the programmes would thus let us understand how to embed the education values in order to construct, reconstruct and deconstruct the blocks of cognitive dissonance and ply them with democratic values.

Keywords: Rising complexities, learning analytics, online knowledge sharing, Social Capital, Intellectual capital

Introduction

In an increasingly intolerant and violent world, where people have to be the victim of daily violence, there is a call for action. Thus as a society, the need of the hour is to rethink the existing institutional structure in place. The peaceful understanding and co-existence between the human beings requires transformative process rooted deeply in attitude and behavior (Shapiro, 2002). One of the major reasons of conflicts and rising tensions, is the legitimization of the other side's point of view, its identity and belief. Altogether it implies the command on one's self emotion and maturity to relate to other perspectives. As Salmon (2004) points out, we learn to see things from the opponent's perspective instead of from the perspective of somebody with whom we agree. The continuously rising complexities and regional imbalances due to the internal and external forces are creating a web of vicious cycle in the cognitive development. The individuals living in poverty are experiencing this clock of vicious cycle frequently. In order to break into this cycle, a platform offering mutual respect, intercultural dialogue, promoting trust and mobilizing the knowledge on different domains to support empathy, compassion, identity (crisis), creativity and innovation based learning is required.

In this article we consider ways in which learning analytics can support and contribute to the development of new approaches, to the assessment of learning and the degree to which new adaptive approaches and planning approaches would be required to bring about the kind of change the institutions demand.

Knowledge sharing platform and barriers

The key task of knowledge sharing platform is to mobilize knowledge (Gupta and Govindarajan 2000). The facilitation of online knowledge sharing platform can lead to increased innovation, performance, and reduce the resources spent on fire fighting (Bohn, 2000), or can say creating balances, which may be Internal or external in nature. The knowledge sharing doesn't come that easy and generally demand the individual's willingness to participate and break the central barrier, leading to Sustainable knowledge sharing platform. The knowledge sharing is facilitated by the push through incentives, with the decrease in extra cost-a particular type of knowledge sharing behavior (Cabrera and Cabrera 2002). The centric-model is to increase the individual willingness to participate in the knowledge through the applied incentives, which can be in form of financial and non-financial awards.

Knowledge sharing is an independent process in which an individual gives something of value and gets something of value. What the individual receives is part of incentives but as Fiske (1991) notes, different types of exchanges involve different levels of reciprocities. The primary goal of knowledge sharing can be conceptualized as continuum ranging from the exploration of new knowledge with renewed combination of existing knowledge (Hargadon 2003). The exploration of new knowledge should focus on more innovation rather than the exploitation of knowledge.

However, the barrier to such knowledge creation is immense with the rising intercultural issues, in the form of lack of trust between knowledge senders and receivers, the epistemologically different faces of tacit and explicit knowledge (Szulanski, 2003). One of the barriers may relate to different faces of knowledge. When it comes to what knowledge is actually being shared, there are endless discussions to what knowledge forms or knowledge can take-or where knowledge exists. Barriers for sharing knowledge can therefore arise from both cognitive

dimensions of knowledge and the epistemologically different faces of knowledge (Hinds and Pfeffer, 2003).

The structural dimension in the physical world data, such as where the knowledge resides, do pose another set of barrier on the level of knowledge creation. The barriers for knowledge sharing are in these instances not caused by ignorance, but rather by not being aware of possible knowledge repositories or not being able to exploit knowledge repositories (Cross and Parker, 2004, p. 36).

The barriers for knowledge sharing can, hence, be related to dimensions of i) the social structure, ii) the different faces of knowledge and iii) structural oddity between the willingness and ability to share knowledge. The dominating explanations for why these barriers arise are i) opportunistic and self-interest seeking behavior, ii) cognitive barriers making it impossible to communicate tacit knowledge and iii) low/negligible awareness – as opposed to ignorance – of knowledge, and no opportunities to endorse the willingness to share knowledge.

Education values with key-link to SDGs and knowledge flow

In order to ensure the inclusive and equitable quality education and promote lifelong learning opportunities for all one needs to understand the key linkages to other SDG goals and their indicators. It is directly linked to:

Goal 3: Good Health and Well Being,
Goals 5: Gender Equality,
Goals 8: Decent Work and Economic Growth,
Goals 12: Responsible Consumption and Production,
Goal 13: Climate Change,
Goal 16: Peace and Justice; Strong Institutions

The technological breakthrough and economies based on knowledge calls for new education values, enhanced levels of skills and competencies for learning and development. The insufficient opportunity to access appropriate learning is resulting in economic and employment consequences and further to the imbalance in environment.

The increasing complexity of knowledge around individuals and organizations, altogether with the growing scale of information put together demand for generating new knowledge (explaining knowledge sharing article...). This calls for placing a close emphasis on social, intellectual, impact parameters and the catalytic agent in the knowledge sharing processes. It depends on the level of network density in the process, including the different level of analysis. The study of capitals and the allied parameters differs in the way the relationship is formed between the trust and the network. Although the role of knowledge production, management and sharing is quite less in discussion as how the information can be created and managed to produce new programmes. In education, we are awash in data about our learners and educators, our technologies and activities, achievements and performance. To date the data has still to be mined intelligently, with the goals of improving learning and informal teaching. The effective use of Big data technology can offer the education system the potential to enhance its systems and outcomes. Education can no longer afford not to use learning analytics.

The framework for Knowledge sharing platform can be defined in the form of knowledge brokers, knowledge enablers, personal learning and maturing environment, dashboard, social and Intellectual capital, social Web and physical world data.

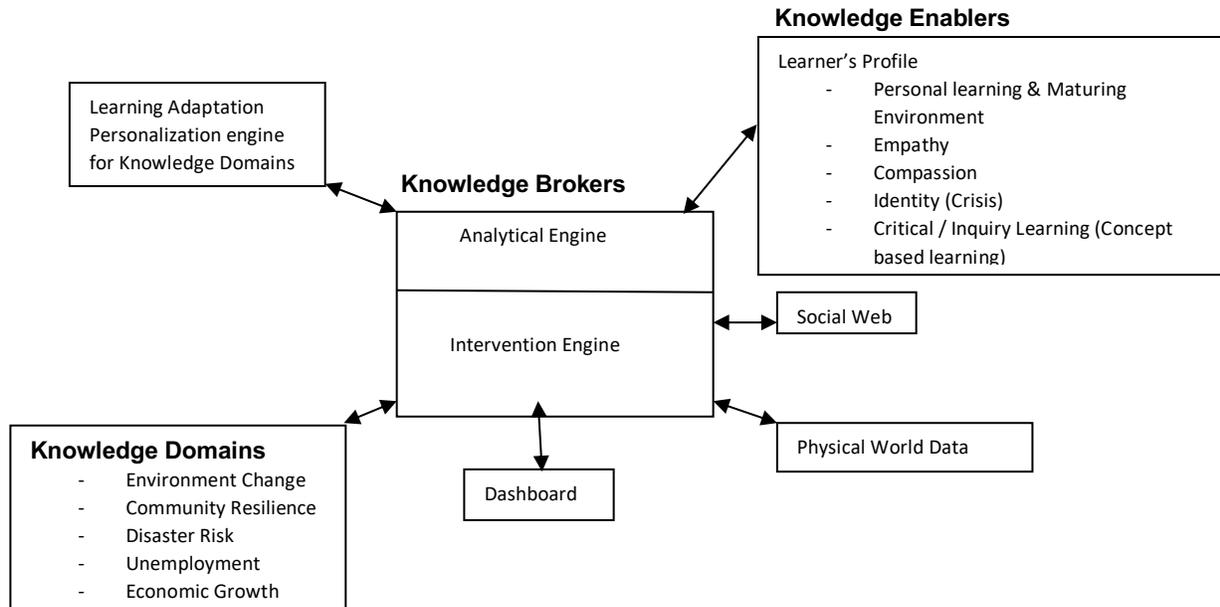


Fig. 2

1. **Social Capital:** Empathy, Compassion
2. **Intellectual capital:** Critical inquiry (conceptual inquiry)
3. **Catalyst:** Identity (Crisis)
4. **Impact parameter:** Cognitive Dissonance/Consonance

such education has to be Lifelong, deeply inclusive with focus on interpersonal skills (Marope, 2014, add reference in end). The failure to include empathy can include the risk of victimization and perpetuation of aggressive acts. This fostering of empathy at the different stages may help to develop the strong correlation between peace education, empathy and compassion supported learning. On grounds of the knowledge flow over the knowledge sharing framework the different stages of impact on the cognitive development may be assessed as per the exposure to regional imbalances and rising complexities. The first set of programming may tend to foster understanding that may be required to be delivered for 'at risk' individuals. The second set could be through explicitly fostering the understanding of one's feeling over the other. The third set can tend to connect the youth, institutions from different parts of the world through exposure, understanding and appreciating different perspectives. The important point of consideration in the above level understands the importance of 'other viewpoint'. The empathy thus identified under the three stages should focus on cognitive, emotional and concerns related to empathy. Ian Harris (1988) further stresses out the need for cooperative learning, critical thinking, moral sensitivity and promoting democratic values in community. As Goleman (2008) points out, the environmental influences are powerful in shaping the youth social and emotional neural circuits. Thus in order to develop sustainability based peace education programmes

those foster empathy and understanding among people, it is important to look into: what kind of skills and mindset one looks to have, with the learning outcomes. Also as pointed out by Maria (2016) about the interaction of youth from different parts of the world on the virtual platform helps to appreciate different perspectives. Further being pointed out that these conversations induce developing deeper understanding and empathy for peer, moving them to act and not just remain as passive bystanders.

The maturing of knowledge with time and an enabling environment plays an important role in the development of key tenets around cognition. The resilience posits upon the cognitive barrier of the individual, which can be stretched to the length and breadth from the very point when he/she is exposed to imbalances in the environment. Those imbalances can happen due to endogenous or exogenous factors. For ex: the continued exposure to violence and displacement promoting actions may to a major extent cause the cognitive development to change over the period of time. This may happen to bring the regional imbalances, which would impact the parameters of cognitive development of learner's web; critical inquiry, empathy, compassion, identity crisis leading to the cognitive dissonance. As the regional imbalances spreads the parameters of identity crisis, which is usually a component 'identity' is impacted which affects the key tenets of empathy, compassion and more importantly responsible for the dissonance in cognitive development. Thereby it challenges the tenets of lifelong learning, which normally follows the linear path to undergo a non-linear trajectory. The per the interplay between the knowledge brokers, enablers, senders and receivers, the close inter-linkage web between the learners relations with components of empathy, compassion, critical inquiry, creativity, cognitive consonance / dissonance, strategic awareness, resilience can be drawn. Consequently the knowledge enhancers are believed to be the creators of knowledge sharing culture (Davenport, DeLong and Beers 1998), and the introduction of knowledge brokers establishing a link between knowledge senders and receivers. This aggregates of all personal learner analytics described in the learners web tends to provide a deeper level of insight into how the individual involved can self assess and evidence it through online engagement. One can also see how the individual has moved within the social network being generated during the course of interaction with peers from other parts of the world. This could be of particular interest since it would help to build the importance of social, intellectual capital involved in the process of knowledge sharing and closely identify the role of catalyst in the knowledge exchange process. This would be extremely helpful from the policy-makers point of view as it would let them understand the key tenets involved in the strategy across any given knowledge domain.

The different approaches with the generic tools can help the assessor to contextualize them to environment and policy analytics, and simultaneously design and map the pedagogical intervention to different analytical patterns.

Learning adaptation across domains

This component of the framework includes adaptivity of the learning processes and learning content. When the learning material is designed to reflect the knowledge architecture of a domain, the content delivered to individual learner can be customized and personalized. This section draws from the learners profile and social media web.

Dashboard

This component presents the visualized data to assist individuals in decision making.

Analytics engine

The analytics engine would capture the performance of the learner and help us to understand the less tangible facts, likely the sentiments of the learner in relation to a topic, the liveliness of debate across the particular topic and the engagement of different learners.

This forms the central component of the Knowledge and learning analytics system. It is a framework for identifying and then processing data from the various analytical modules. The analytical modules could be environment change, disaster risk reduction, unemployment etc...the analysis and scope of the discussion forum on the knowledge sharing platform would involve in identifying and detailing the scope of the forum and then applying analytical techniques such as social network analysis, natural language processing, and to understand the degree of compliance between the log learner data and assessment knowledge arenas. The process of concept development among the peer groups, the development of prediction models based on human behavior assessment(Baker, Carvalho, 2008). The analytics engine can incorporate data from physical world data, social web and online knowledge sharing platform.

Map the learning in a Lifelong learners Web

The key concepts and competences needs for the 21st century education has to be more holistic, integrated and creativity infusing through the peace education. Among other values,

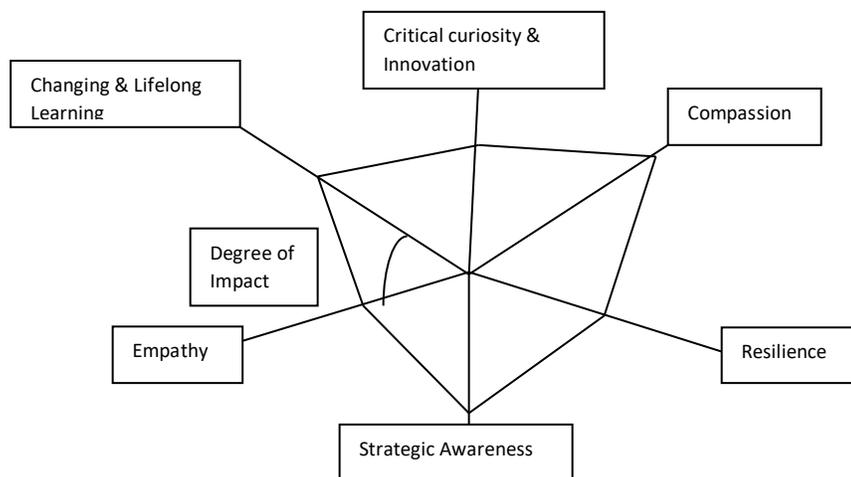


Fig. 2 Lifelong Learners Web

Measuring social capital, intellectual capital, role of catalyst in knowledge sharing

The empirical studies on social and Intellectual capital mains concerns on their relationship to the economic development and the inter-linking among the social, intellectual and the parameters of catalyst and impact. The structure of social capital differs in the way that it pushes the pressure in social impact parameters on empathetic and compassionate strings of the brain. The intellectual capital parameter exerts pressure on the Innovation and creativity

consciousness part of the brain. The regional balance thus drives the overall stability of the cognitive development, enhancing the cognitive efficiency over the period of time. The catalyst 'Identity' plays a major role in the cognitive efficiency. The regional imbalances may lead to destabilize the functional parameters of 'Identity', which may impact the overall cognitive development into 'crisis', thus striving to Identity (crisis). The regional imbalances may be caused due to stress causing parameters as unemployment, environmental changes, social services and community resilience. The social capital, intellectual capital and role played by catalyst in a conducive environment when looked through the compartmentalized lens leads to the regional imbalances. The binaries of 'peace' and 'sustainable development' require the de-compartmentalization of thoughts generated through the regional imbalances. This would necessarily call the resilience to be stretched along the length and breath of cognitive development. The rising complexities attributed to disaster risk, environment change, community resilience, unemployment etc.. is contributing majorly to the rising in the environment complexities with the space and time. This is further causing the imbalance in the regional forces that hold the key to peace and sustainable development. The negative externalities arising due to rising complexities is challenging the resilience of the cognitive development, thus play a pivotal role in the violence and unrest related activities.

Equation:

Social Capital + Intellectual Capital -----catalyst-----» Cognitive consonance / dissonance

Knowledge sharing platform and the role played by learning analytics in reducing rising complexities

The online knowledge based platform may help to bring the practitioners, students, researchers and policymakers from around the world to come together on one platform to share the knowledge and best practices. It would specifically help to bring the youth from small and least developed island countries to bring their learning on the table. The online communication the individuals form different communities and roles would tend to bring them closer to understand what actually affects the balancing forces in the region. The discussion across the different knowledge domains would help to understand the knowledge building around the domain. The matrix among the likes of knowledge enablers, brokers and knowledge domains would help to initially understand the impact level on the cognitive development. The lesser impact on the clockwise direction would help us understand the lesser impact of a particular domain in the following direction. The anti-clockwise impact level would tend to increase the level of cognitive dissonance. The higher is the cycle in negative direction, more is the impact on the cognitive development in reverse direction, thus lesser is the positive impact on social and Intellectual capital. The higher is the cyclical loop in the positive direction, the more is the confidence level being build in the online knowledge sharing platform. This would positively impact the buildup of knowledge domains leading to increase in social and Intellectual capital of the individual involved, thus leading to the cognitive consonance.

Mapping of information to develop sustainability based programmes

The major objectives of the online exchange of information among the stakeholders in different knowledge domains can be transformed into the information pipeline of data analytics. The learning analytics can help to unveil and contextualize the hidden information and prepare it for different stakeholders, specifically the policy makers to draw the relevant information for building sustainability based educational policy making. The Monitoring, comparing and mapping the online information flow and social interaction among the stakeholders can open new insights and gateways to avenues.

The quantification of the self critical assessment would be helpful through the learning process. The reflections of this critical self-evaluation through other stakeholders dataset can be important. Thus in this vertical model of information flow the level of trust may increase with the interaction, leading to positive cognitive consonance. Thus the 'cognitive sustainability' may tend to be more centric towards enhanced resilience and efficiency

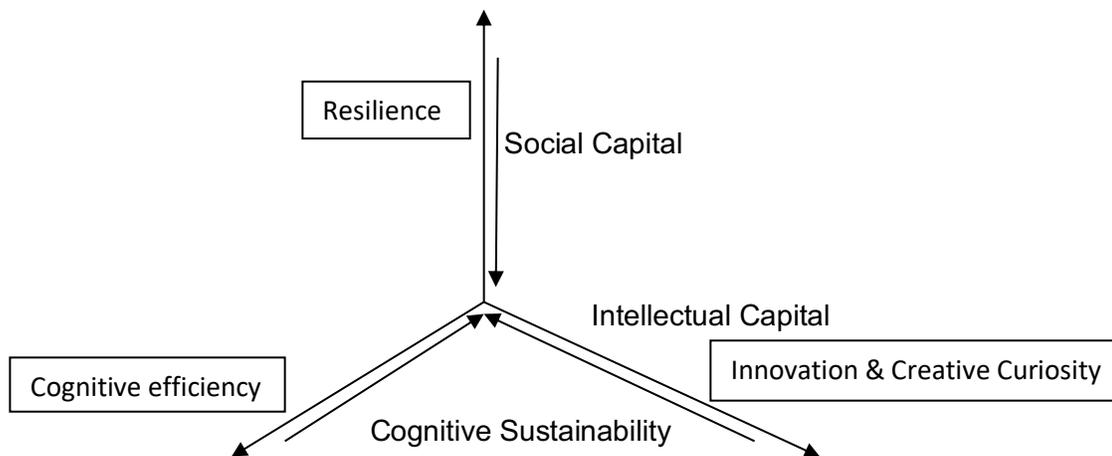


Fig. Cognitive Sustainability diagram

As the resilience tends to move away from the centre the imbalance in the cognitive efficiency and Innovation would happen. The impact in other two parameters will simultaneously affect the third parameter and thus the cognitive sustainability.

At the individual level, the learning can help provide support to enhance monitoring support process and suggestions interventions for individuals. The learning analytics, as a support technology, is helpful for decision making process. But since the analytical finding is just for the quantitative approach, which cannot reflect upon the qualitative nature of the individual. This it may diverge from the innovation, creativity curiosity, empathetic learning, which drives the individual growth. Empathetic learning been identified as a key to effective teaching. According to a study carried out by Harvard, cultivating empathy among the students is linked to desirable outcomes, including positive peer relationship and better interpersonal conflicts. The level of

stress caused due to rising complexity continuously pushes through the feeling of depression, envy and inferiority, which may frequently act as obstacle to empathy and thus the individual lacks with the inherent capacity of brain to appreciate the peer perspectives.

Impact Assessment Matrix

Domain Enablers	Environment Change	Unemployment	Community Resilience	Disaster Risk	Economic Growth and development
Empathy					
Compassion					
Identity (Crisis)					
Critical Learning (Conceptual Learning)					
Cognitive Consonance / Dissonance					
Impact level parameter	 Very low	 Low	 Medium	 High	 Very High

Note* - The impact in the clockwise direction would have positive effect on cognitive development, whereas the anti-clockwise direction would have negative impact on the cognitive compartments.

The learning analytics can also provide support to the predictive (Siemens, 2011) behavior of the individual, which can help to regress mapping in order to improve the cognitive efficiency but since this predictive modeling based on the limited set of parameters can only provide limited insight about the learners potential. With respect to Knowledge domains, it would be difficult to judge which learning activity can impose high or low impact on the learning process of the individual. Thus the domains of knowledge, with the penetration of learning analytics / technological intervention, to a certain extent may or may not be pedagogy neutral.

India, being a diverse community also pose a huge challenge on the front when it to cognitive dissonance The parameters of education value get impacted over time and again, when the migration happens in certain regions of the world. India, being an emerging economy, but still the service sector is concentrated to the urban areas in few parts of the country. The influx of youth, either for the inculcating education, or migration due to job initiatives do let them undergo varied level of psychological development over the period of time. Further adding to it the is the presence of radical elements in the system.

Knowledge domain and Learning analytics

The use of learning analytics holds promise for Technology Enhanced Learning, which is a key component of lifelong learning aspect. It offers new methods and tools to diagnose the learner needs and provide personalized instructions to better address these needs. The learning analytics has been effective with behaviourist-instructionist style approaches, but it doesn't have sound evidence to support the constructivist approach to learning (Duffy & Cunningham, 2001). The learning is seen here as an active cognitive process where the learner constructs their concepts of world while on knowledge sharing platform. Thus the correlation between constructive approach related to the information contribution with the development of domain.

The development of thus any particular pedagogy can take shape depending on the pedagogic behavior of the user. Thus it solely depends on the knowledge sharing platform being built by the developer (Dron & Anderson, 2011).

The knowledge domain concerning pedagogical goals can also be applied explicitly. This may determine the outcome of analysis and together with interpretation applied may lead to a variety of options for interpretation and consequences. This may open the avenues for new behaviors.

One has to see that pedagogic input factors are not restricted to behavior, but also been extended to beliefs, societal values, and implicit and explicit theories of domain specific knowledge and learning.

Policy matters for knowledge sharing through learning analytics

The knowledge sharing platform can be considered as a superb example of the complex education system (Gupta & Anish, 2009) with anarchy in nature. Together with the history and differences in stakeholder perspectives (Sabatier, 2007), policies are crucial driving forces that underpin the complex and systemic institutional problems. This helps in shaping the perception of the nature of the problem and its acceptable solutions. It happens only through the implementation of a planning process driven by new policies that institutional change can happen.

The challenge about bringing the change in individual, institution and other stakeholders involved in the knowledge sharing process in such complex and anarchic adaptive system (Head & Alford, 2013), a system that is complex, intractable and unpredictable. They are also in the likes of resistant to change. They are resilient in face of perturbation; exist far from equilibrium, requiring constant input of energy to maintain system organization. One factor that has been hindering institutional change for better use of analytics appearing to be their lack of data driven and available data can be overcome with the online knowledge sharing platform. Another issue of lack of clarity among the researchers and decision makers on different languages, their lack of familiarity with statistical methods, and their failure to present the data efficiently and effectively to decision makers and the researcher's tendency to hedge and qualify the conclusion can be overcome with online knowledge sharing platform. The developer concerned for establishing the knowledge sharing platform would tend to root out the existing barrier in context to drawing conclusion from qualitative and quantitative data to a greater extent. This can assist in shaping the political, social, cultural and environmental and technical norms of information exchange amongst the diversified stakeholders involved in the platform. What is required to be emphasized is not just the larger amount of logical data (Kotter & Cohen, 2002) but the critical factors involved in the values perspectives those ground from the major social issues of identity, modern lifestyle, technical rationality and scientific issues (Head &

Alford, 2013) are insufficient to understand the mechanism behind rising complexities but should also be expanded to including cultural and capacity gaps those are grounds for regional imbalancing (Norris & Baer, 2013).

Further in today's dynamic system, the modern policy system are not technical puzzles that can be solved through relying on the sole discretion of scientific knowledge, but instead they fall in flux of multi-factoral challenges, in form of social, intellectual, political, environmental, cultural and economic. An imbalance with these factors in form of uncertainty, ambiguity and challenge to the values, are holding key to designing the stability and integrity of equation for regional balance.

The systems, whether open or closed are widely governed by common set of behaviors, patterns and properties. Since the system are dynamic and strongly interconnected to facilitate resilience (Capra, 1996), they should be looked from the lens of interdisciplinary approach rather than a silo one.

DPSEEIF Loop based Framework

This framework will help us to particularly assess the Cause-Effect-Impact & Feedback in the online knowledge sharing platform. The framework has been chosen to be a loop based system since the feedback to be the input the input for the system in order to enhance its efficiency. The feedback system would be effective in informed and impact based policy making. The loop based system would further tend to keep a continuous check on the cognitive capability of the individual and stress to enhance those areas which require immediate attention.

Driving force: Rising complexities

Pressure: Identity, Compassion, Critical learning (Conceptual learning), Empathy, social and cultural values

State: Online knowledge sharing platform with open access to data (Outlier)

Exposure: Environment change, Unemployment, Community resilience, Social service etc..

Effect: Cognitive Dissonance / Consonance

Impact & Feedback: Forces driving regional balance namely environment, social, economic, political and economic quartet

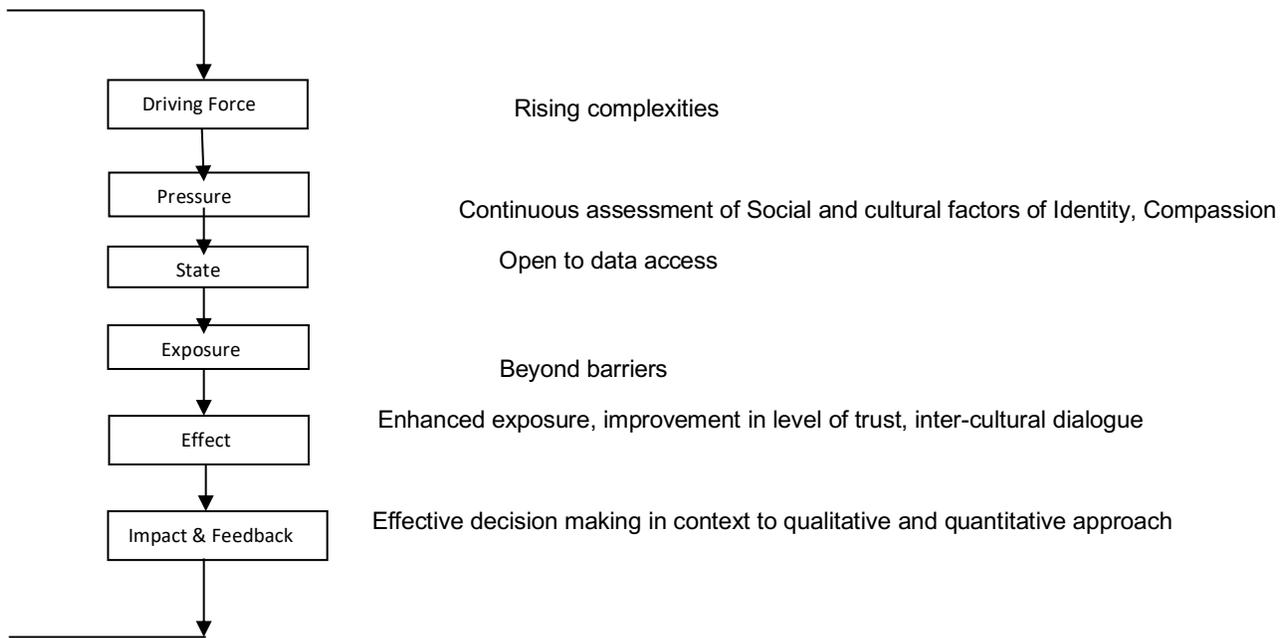


Fig. DPSSIEF Loop based Framework

Conclusion

The online knowledge sharing platform has potential to deliver the developed understanding, empathy and compassion while appreciating the perspectives of peers. The tenets of social and Intellectual capital play a key role in cognitive development, moreover the factors emphasizing the consonance / dissonance. The fostering of the socio-emotional skills offers them the tools to recognize and respect others perspective. Thus the gateway for the responsible citizen in 21st century is to recognize that we can no longer be passive bystanders to rising complexities and regional imbalances caused by violence.

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