

**ISSN 0970-9827**

**JOURNAL  
OF  
ALL INDIA ASSOCIATION  
FOR  
EDUCATIONAL  
RESEARCH**

**Vol. 28**

**No. 2**

**December 2016**

**Access this journal online at <http://www.ejournal.aiaer.net>**

# **JOURNAL OF ALL INDIA ASSOCIATION FOR EDUCATIONAL RESEARCH**

Volume 28 Number 2 December 2016

## **CONTENTS**

### **Editorial**

Can free and compulsory school education by 2030 in India be a reality?

*Sunil Behari Mohanty* 1

Nurturing creative thinking

*Panagiotis Kampylis and Eleni Berki* 18

Guiding principles for learning in the twenty first century

*Conrad Hughes and Clementina Acedo* 42

Task, teaching and learning: Improving the quality of education for economically disadvantaged students

*Lorin W. Anderson and Ana Pešikan* 79

Status of continuous and comprehensive evaluation at elementary stage

*B.N.Panda* 106

***Journal of All India Association for Educational Research***  
***Vol.28, No.2, December 2016, 1-17***

## **EDITORIAL**

### **FREE AND COMPULSORY SCHOOL EDUCATION**

#### **BY 2030**

All developed nations make provision for free school education for a stipulated period for their future citizens. Some nations also provide pre-school education. European Commission/EACEA/Eurydice (2016) mentioned that compulsory period of schooling in European nations vary from 9 years (Switzerland) to 13 years (Hungary...). Starting age of schooling varies from 3 years (Hungary) to 7 years (Estonia..) and leaving age varies from 14 years 5 months (Serbia ) to 19 years 6 months (Macedonia). In UK, leaving age is 16 years for all its four regions, but starting age is 4 years for Northern Ireland and 5 years for other three regions-England, Scotland and Wales. While UK has a compulsory schooling for 11-12 years, will India be able to have at least 10 years of schooling (Classes I - X) by 2030, given the situation that it has yet to grapple with achieving compulsory school education for 8 years (Classes I-VIII)? In 1950, the constitution of free India, stated in its article 45 of the Directive Principles that “The State shall endeavour to provide, within a period of ten years from the commencement of this Constitution, for free and compulsory education for all children until they complete the age of fourteen years.” There was no mention of the starting age. In order to give a boost to ongoing efforts, the central government went for constitutional amendment to make elementary education a part of fundamental right for citizens of the country. As per the Constitution (86<sup>th</sup> Amendment) Act 2002 (MLJ 2002), Article 21 A states that “The State shall provide free and compulsory education to all children of the age of six to fourteen years in such manner as the State may by law, determine.” As per this amendment, Article 45 of Directive Principles, states that: “The State

shall endeavour to provide early childhood care and education for all children until they complete the age of six years”. A child of six years age is covered both in case of school education under Article 21 A of fundamental right as well as in case of ECCE under Article 45 of Directive Principles. Should Article 45 be modified to specify the starting age and leaving age and reduce upper age limit to five years, instead of six years, which is covered under Article 21?

MWCD (2017) mentions that Integrated Child Development Services (ICDS) scheme of the Ministry of Women & Child Development, functioning since 1975 covers 0-6 years of age including pre-school education for 3-6 years of age. Should this scheme be modified to have upper age limit as 5 years and have its pre-school education for children of 3-5 years, instead of 3-6 years?

MLJ (2009, p. 5 - Section 11) states that

“11. With a view to prepare children above the age of three years for elementary education and to provide early childhood care and education for all children until they complete the age of six years, the appropriate Government may make necessary arrangement for providing free pre-school education for such children”.

Should this section be modified by making five years as upper age limit for pre-school education? Should this section regarding ECCE be deleted, as ECCE is being covered by ICDS?

Quality of teaching and learning at primary school stage depends on the quality of teachers, which in turn depends on teacher remuneration. MLJ (2009, p. 8- Section 23(3)) states that “The salary and allowances payable to and the terms and conditions of service of teachers shall be such as may be prescribed.” A national act for free and compulsory education may need to specify salary scales for various types of school teachers, to be followed by all State governments. Such a scale of pay may need to take into consideration number of years spent for acquiring

a teacher training degree: (a) Two year B. Ed. degree (5 years after +2) (b) B.A./ B.Sc. & B.Ed. degree (4 years after +2) and One Year B. Ed. degree (4 years after +2). The teacher salary varies from one state to another. Certain categories of teachers in government schools in a State get a monthly remuneration of Rs. 5,300/- (Five thousand and three hundred) per month. They continue to receive this amount for a specified number of years, after which they get full salary. In order to augment income, one low paid teacher was seen working as auto rickshaw driver in a nearby town. In certain non-aided primary schools, a teacher gets a consolidated amount of Rs.3,000/- (Three thousand) per month. If such a person is married and is having a family, how can that family be managed with this small amount of remuneration? This situation has compelled many low paid teachers not to teach properly in the class so that parents of children are compelled to send their children for private tuition given by the same teacher, before or after school hours at his/her residence or at the residence of the student. It is an interesting phenomenon that the amount earned by some teachers from private tuition is more than five times of their salary. The practice of private tuition makes all types of elementary school education provided in government schools also fee charging. The nation may need to carry out a survey of private tuition by school teachers to estimate the gravity of situation and reflect correctional measures in proposed new education policy.

MLJ (2009, p. 8 - Section 28) states that “No teacher shall engage himself or herself in private tuition or private teaching activity.” Should this provision be modified by inserting “getting appropriate salary as applicable to central govt. teachers on regular basis” after the word “teacher”? Private tuition is also known as ‘Shadow Education’, which according to Bray & Kwo (2014) runs parallel to formal system of education. OECD (2016a & b) reported results of latest PISA (Programme for International Student Assessment), in which, South East Asian nations dominated. Shadow education might have helped their students to perform better. Banning private tuition will not be effective as many parents arrange private tuition for their children so

that during evening hours children do not watch TV with parents. Pre-school children are also seen attending private tuition classes. There are also parents who send their children for private tuition to take care of learning problems of their children due to multi grade teaching or teacher absence. Again, if high fee charging schools and schools having air conditioned classrooms are to continue, there may not be any solution of issue of equity in education by banning private tuition. Rather in order to tackle menace of private tuition that may be reflected in advance knowledge of a few students availing private tuition, the schools may need to maintain a record of students attending private tuition classes or getting private tuition at their homes, so that school teachers become aware of type of student learning in private tuition classes and design their teaching strategies to handle these students appropriately in the classroom.

MLJ (2009, pp. 5-6 - Section 12) provides reservation for children belonging to weaker section and disadvantaged group in the neighbourhood. This provision is also applicable for admission to pre-primary class in a school. The act provides state reimbursement of expenditure. Govt. also spends for pre-school education for all through ICDS, which is a scheme of the central government. Hence, should the nation consider deleting provision for 25% quota for admission in pre-school classes, as it may amount to unnecessary doubling of govt. expenditure? The act provides that school "shall be reimbursed expenditure so incurred by it to the extent of per child expenditure incurred by the State, or the actual amount charged from the child, whichever is less, in such manner as may be prescribed." This provision accepts the fact that government schools are inferior to the private schools. There are various reasons for growth of fee charging private schools. Preference for English medium education makes many parents go for private fee charging English medium schools. During colonial period, Govt. of Orissa had a Basic school in a village called Tudigadia. The villagers, interested in English medium schooling, started a private school. Both the schools continued for many years, even during post-independence period, having low student strength in each school.

Private schools are preferred as the class size is smaller and there are more co-curricular activities than found in case of government schools. Although in case of most of the non-aided private schools, teacher salary is much lower than the government schools, threat of punishment for poor performance of students, makes these low paid teachers work more efficiently than teachers of government schools. Should the government consider running English medium schools, if demanded by parents ? Should not the nation raise the quality of government schools so that parents do not opt for private schools?

MLJ (2009, p. 4 - Section 7 (6)) mentions that “The Central Government shall (a) develop a framework of with the help of academic authority specified under section 29”. MHRD (2009, section 29(2) ) states that “ (2) The academic authority, while laying down the curriculum and the evaluation procedure under sub-section (1) shall take into consideration the following, namely: ... (d) development of physical and mental abilities to the fullest extent;..” Should the act be modified by adding “emotional, spiritual” in clause (d), after the word “physical”? Should the act be modified by adding another sub section which may be “(i) availability of teacher time per class”? This inclusion becomes necessary because of the fact that as per MHRD (2009 Schedule), there are primary schools with 5 classes (I-V) having (a) 2 Teachers (Teacher time 2/5 per class), (b) 3 Teachers (Teacher time 3/5 per class), (c) 4 teachers (Teacher time 4/5 per class) and (d) 5 teachers (teacher time Full 5/5 per class). If these types of schools are to exist, curriculum needs to be developed for each type of school. Dodging of this issue is enforcing private tuition on poor parents. In case, the nation is going to have national curriculum framework, there has to be same amount of teacher time per class be available for every school. A national / state curriculum presupposes that there is no double or triple class teaching by any teacher and there is at least one teacher per class / section, in every government and government aided primary school, even if, number of students is less than 30 in a class /section. In case of schools in locations accessible by road, it may be possible to have a school with 100 children by arranging a vehicle for transport and maintaining one teacher per class /section and have the state curriculum.

In case of segregated habitations in hilly regions, desert areas and islands, there may be residential primary schools having one teacher per class/ section.

MHRD (2010a) authorised the “National Council of Educational Research and Training as the academic authority to lay down the curriculum and evaluation procedure for elementary education, and to develop a framework of national curriculum under clause (a) of sub-section (6) of section 7 of the Act.” According to MHRD (2010b), “NCF, 2005 shall be the national curriculum framework till such time as the Central Government decides to develop a new framework.” As states differ in their school system such as number of classes in a middle school / upper primary school, should NCERT role be limited to developing national level benchmarks and standards for three categories of schools-Jawahar Navodaya Vidyalayas, Kendriya Vidyalayas (Central Schools), Sainik Schools? Should the act be modified to allow states develop benchmarks and standards for (a) residential schools exclusively meant for scheduled tribe /scheduled caste students, (b) schools for physically and mentally handicapped and if multi grade teaching is to continue, benchmarks for a five class/section primary school with (a) 5 teachers, (b) 4 teachers, (c) 3 teachers, and (d) 2 teachers? Since, there are slow learners, learners who do not attend classes regularly, but enjoy non-detention policy and go up the ladder every academic year, and there are schools, which are victims of teacher shortage, teacher truancy and multi grade teaching, should the nation consider empowering parent teacher body of each school to decide curricula, keeping in view state curricular framework?

MLJ (2009, p. 9 - Section 29(2)) mentions that

“The academic authority, while laying down the curriculum and the evaluation procedure under sub-section (i) shall take into consideration the following, namely-... (h) “comprehensive and continuous evaluation of child’s understanding of knowledge and his or her ability to apply the same.”



State education authorities vary in their understanding of strategies for evaluation. A few days ago, a school teacher informed that answer books of a school in a Block are to be examined by teachers of another block. In such a situation, what a teacher teaching more than one classes will do? Will s/he dictate answers to students and train students in malpractice? Should the act be modified by inserting the word “internal” before the word “evaluation”? MLJ (2009, pp. 4-5) states that “The appropriate government shall -... (h) ensure timely prescribing of curriculum and courses of study for elementary education;”. Should the words “and courses of study” be deleted ?

MHRD (2017) states that academic authority shall “... (c) prepare class wise, subject wise learning outcomes for all elementary classes. Should the RTE rules be modified by inserting the words “school category wise” after “subject wise”, and the word “outcomes”, be replaced by “standards and benchmarks”?

Physical education plays an important role in primary school education. The Twelfth Five Year Plan document (Planning Commission 2012, p. 78) states following strategies for physical education:

“School playgrounds of NVs and KVs will be opened up to neighbourhood schools. Local bodies would be impressed upon to extend support in earmarking open fields, sports stadia and community playgrounds for neighbourhood schools in urban areas, as many private schools and even some publicly funded schools do not have playgrounds within school campuses in many cities and towns. Such schools will be encouraged to adopt alternative sports and games activities that support physical development and nurturing of kinaesthetic intelligence.”

National Policy for Children 2013 (MWCD 2013a, Art 4.6-xvi) states that the State shall take all necessary measures to “Ensure that children’s health is regularly monitored through the school health programme and arrangements are made for health and emergency care of children.” National Policy on Education 1986 (With

modifications undertaken in 1992) (MHRD 1992, p. 41) gave stress on physical education including yoga education in the following words:

“As a system, which promotes an integrated development of body and mind, Yoga will receive special attention. Efforts will be made to introduce Yoga in all schools. To this end, it will be introduced in teacher training courses.”

National Curriculum Framework 2005 (NCERT 2005 p.57) states that:

“The more recent addition to the curriculum is yoga. The entire group must be taken together as a comprehensive health and physical education curriculum, replacing the fragmentary approach current in schools today. As a core part of the curriculum, time allocated for games and for yoga must not be reduced or taken away under any circumstances.”

Importance of yoga education has also been highlighted by UN. Since 2014, UN has started observing International Yoga Day on 21<sup>st</sup> June. The Secretary General of UN in his message for first International Day of Yoga observed on 2015 June 21 (UN 2015) stated that “Yoga offers a simple, accessible and inclusive means to promote physical and spiritual health and wellbeing.” Physical education teachers are trained in yoga as part of their course work. As this is not the case with general teachers, Mohanty (2016, p. 13) suggested that school teachers need be appropriately trained, if yoga is to be introduced for all. In order to provide education for development of body, should every elementary school have physical education every day including sun days and holidays in the afternoon, after giving snacks to every student? Should the schools be empowered to utilise volunteers from the locality to impart training in physical education? School health care is an essential element of physical education. Should the nation make adequate provision for at least one medical checkup for every student, every year?

MHRD (2010 c) authorised the National Council for Teacher Education (NCTE) “as the academic authority to lay down the minimum qualifications for a person to be eligible for appointment as a teacher.” It is also a fact that a large number of teachers follow the way they were taught by their own school teachers, instead of following the ideals taught in teacher training institutions (Schwille, Dembele & Schubert 2007). In US, since two decades, certain schools have been authorised to appoint persons of their choice and train them on the job. US: Office of Assessment, Research, and Data Analysis (2012, p. 2) states that:

“The requirements of alternative certification programs vary widely, but most programs are shorter, less expensive, and more practically oriented than traditional university-based programs. Pre-service preparation typically ranges from four to 12 weeks during the summer before new teachers enter the classroom. The programs usually include coursework in pedagogy and subject area knowledge, practice teaching, and continuing support for teachers once they enter the classroom in the form of mentoring and professional development.”

The Open University, UK (2013, p. 11), while mentioning different routes into teaching in England and Wales area of UK, stated about school centred initial teacher training as follows:

“These are training schemes provided by groups of neighbouring secondary and/or primary schools in England. The group of schools acts in the same way as an ITT institution and programmes lead to QTS and possibly a PGCE. Courses generally last one year and they allow graduates to complete almost all of their training in a school environment. Trainees are required to meet the same standards set for PGCE students.”

Both UK and US have school based as well as university based initial teacher training. School based training has been found to be more beneficial than university based teacher training. IIEP (2008, pp.13-14) states that:

“The greatest benefit of school-based training underlined by participants is the possibility of reducing the gap between what is taught in formal training institutions and the reality inside the schools. School-based training is therefore seen as a way to make the training more practical and reduce the effects of a possible ‘culture shock’ when beginning teachers are faced with a real teaching environment.”

In Indian situation, the quality of university based teacher training has been questioned. In order to take care of quality in teacher training, the central government instituted National Council for Teacher Education (NCTE). In 1998, NCTE brought out a curriculum framework (NCTE 1998) that recommended two year B.Ed. course. Two year B. Ed. courses were instituted in Regional Institutes of Education of NCERT. For 15 years, no State government started two year B. Ed. courses. There are instances of NCTE recognised government institutions running B. Ed. courses having majority of faculty members, who did not possess either a M.Ed. or a M.A.(Education) degree. Such a situation was reported by Attri and Chandel (2009). NCTE recognised B. Ed. courses are also going on in District Institutes of Education and Training, without having any Lecturer in Education. There are also instances of many teacher educators imparting training in teaching of a school subject that they have not taught in a school or have studied it at the degree stage. As it has not become possible for NCTE to ensure quality in initial teacher training even in government teacher training institutions and university departments of education and colleges of education, and a large number of faculty in university based institutions having neither previous nor current school teaching experience impart training in school teaching skills, should the nation allow selected schools or groups of schools to recruit individuals as teachers and train them with or without any support from university based teacher trainers? Advanced nations have induction programmes for new teachers. In Indian situation, instead of introducing such an induction programme, the nation may consider

devoting second year of two year B.Ed. programme for teaching practical in schools through appropriately selected mentors trained by appropriate central and state agencies..

Class size has been now considered as an element of quality teaching and learning. OECD (2016b, p. 202) states that

“Class size can affect learning in various ways. Large classes may limit the time and attention teachers can devote to individual students, rather than to the whole class; they may also be more prone to disturbances from noisy and disruptive students. As a result, teachers might have to adopt different pedagogical styles to compensate, and these, in turn, might affect learning.”

As large class size reduces the amount of teacher-taught interaction and forces non poor parents provide private tuition for their children. Should the Act be modified to specify maximum number of students permissible per class/section in a primary school and in an upper primary school?

All developed nations give stress on equity in education, especially at the stage of compulsory education. Gurria (2016, p.4) in Foreword to PISA 2015 Vol.2 stated that “Achieving greater equity in education is not only a social justice imperative, it is also a way to use resources more effectively, increase the supply of skills that fuel economic growth, and promote social cohesion”. In a study of situation in Latin America, UNESCO (2017, p. 27) stated that:

“students who attend rural schools are at a clear disadvantage: just 20% of them attend schools with sufficient access to drinking water or sanitation; only 22% attend schools with a sufficient connection to electricity or telephone; only half are in schools with appropriate academic spaces; 24% have schools with insufficient administrative spaces; and less than half (41%) attend schools with sufficiently equipped classrooms.”

OECD (2017, p. 51) stated that “PISA consistently finds that disadvantaged students perform worse than advantaged students, even if the strength of the relationship varies greatly across countries.” Internationally, in case of academic achievement, generally, students from disadvantaged locations and communities fall behind those from rich locations and communities.

In case of Indian situation, as per schedule in MLJ (2009, p. 14), the number of teachers to be provided in a primary school varies as per the norm: (a) 2 teachers for 1 to 60 students; (b) 3 teachers for 61-90 students - 3 teachers; and (c) 4 teachers for 91 to 120 students. As in a given time interval, the curriculum that can be covered by one teacher per class cannot be covered by one teacher covering students of two classes, in order to ensure equity, the nation may consider to provide at least one teacher per class/ section of 1 to 30 students. Certain nations have started yearlong schools / full day schools for children in deprived locations. In US, there is even a National Association for Year-Round Education. In India, it may be appropriate to have year-round schooling for schools in difficult locations by providing higher scale of pay to teachers posted in such schools. In case of schools in developed nations, there is non-detention policy as well as provision for remedial teachers to take care of slow learners. In Indian situation, if non-detention policy is to continue, remedial teachers may need to be posted in schools. MLJ (2009, p. 12) mentions provision of part time instructors for art, physical education and work education in a school having class VI to VIII and having a student strength above one hundred. The nation may consider removing minimum number of children in such a school, as teaching of art, physical education and work education is an integral part of the curriculum? Besides, the nation may consider having part time instructors for music and dance. The nation may consider to have part time teachers for art, physical education, dance, music and work education for primary schools. In addition, the nation may consider having club activities starting from class I. Forty years ago, the author had observed how a primary school in UK carried out club

activities were carried out with the help of volunteers from school community (Mohanty 1980). In Indian situation, club activities may be carried out with the help of appropriately selected volunteers from the community.

Even after 14 years after amendment of constitution that made elementary education a fundamental right and seven years after formulation of act to implement free and compulsory elementary education, there is talk about tackling non-school going children. The Act accepts the fact that all children of six years of age will not join school and makes various types of provision for education of drop-outs and left outs (MLJ 2009, p. 3 – Section 4 and p. 10 - Section 38 and MHRD 2013). Issue of special training will not arise, if the government can take measures to have a nation which does not have child worker, child beggar and child engaged in taking care of younger brother or sister at home, in the absence of their parents. The Times of India (2017 April 22, p. 6) reporting on child beggars in Chennai stated that “almost every other kid ill-treated to “solicit sympathy for higher earnings.” The nation may also consider having residential schools for education of children without parents and children whose parents cannot take care of them due to poverty or other reasons.

Funding is an important issue. States vary regarding classes taught in a school. For instance, in Odisha state, class VIII is generally part of high schools, which have classes IX and X and classes VI and VII are part of middle schools. Should the state that cannot ensure that a primary school teacher in a private school gets monthly remuneration that is more than the monthly remuneration paid to an unskilled labourer spend funds to transfer material resources pertaining to class VIII from high school to upper primary school? What should be the priority- shifting of class or remuneration to teacher? There may not be any problem for the purpose of statistical data by going for class wise data instead of stage wise data.

Quality of elementary education is an important issue. MLJ (2009, p. 4-Section 8(g) mentions that the appropriate government shall

“ensure good quality elementary education conforming to the standards and norm specified in the Schedule.” The schedule has not been able to specify standards in appropriate format. The Act may be modified to give details of standards and norms. Again, standards and norms may vary from one State to another and also from one category of schools to another. If the multi grade teaching will have to continue, it may be appropriate to develop quality parameters for each category of primary school, taking into account number of classes/sections taught by a teacher. There is also a need to specify quality parameters for various types of government schools: (a) special schools for handicapped, (b) residential schools for Scheduled Tribe and Scheduled Caste students, (c) Jawahar Navodaya Vidyalayas, (d) Sainik Schools, (e) Kendriya Vidyalayas, etc. as there is much variation in quality of intake in these types of schools.

### CONCLUSION

While the nation is facing problems in providing free and compulsory education till class VIII, goal 4 of sustainable development strategy of UN as reported in UNESCO (2016, p. 20) has the target of providing (a) inclusive and equitable quality education and promote lifelong learning opportunities for all, (b) by 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes and (c) by 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education. In order to achieve these targets, the nation may need to formulate a new act for free and compulsory school education.

### REFERENCES

- Attri, A. K. & Chandel, R. (2009) Teacher Education in Himachal Pradesh. *Journal of All India Association for Educational Research* 21, 1, 87-90, June.
- Bray, M., & Kwo, O. (2014) *Regulating Private Tutoring for Public Good-*



*Policy Options for Supplementary Education in Asia*. Hong Kong: Comparative Education Research Centre, University of Hong Kong; and UNESCO Asia and Pacific Regional Bureau for Education, Bangkok.

Retrieved from <http://unesdoc.unesco.org/images/0022/002270/227026E.pdf>

European Commission/EACEA/Eurydice (2016) *Compulsory Education in Europe – 2016/17. Eurydice Facts and Figures*. Publications Office of the European Union, Luxembourg. Retrieved from file:///C:/Users/Suman/Downloads/ECAP16001ENN\_002%20(1).pdf

Gurria, A. (2016) Foreword. In OECD, PISA 2015 Results (Volume II): Policies and Practices for Successful Schools, pp.3-4. PISA, OECD Publishing, Paris. Retrieved from <http://dx.doi.org/10.1787/9789264267510-en>

IIEP (2008) *Developing and Maintaining Adequate Numbers of Competent Teachers*. Author, Paris. Retrieved from

<http://daotaoquocte.edu.vn/eng/coe/conference2009/21.Anh.pdf>

MHRD (Ministry of Human Resource Development) (1992) *National Policy on Education 1986 (With Modifications Undertaken in 1992)*. Govt. of India, New Delhi.

MHRD (2010a) *Notification No. SO 749(E) dated 2010, March 31 (Gazette No. 622 dated 2010, April 5) Authorisation of NCERT to Lay down the Curriculum and Evaluation*. Govt. of India, New Delhi.

MHRD (2010b) *Letter No. F.No.1-13/2009-E-4 dated 31<sup>st</sup> May, 2010 on Developing a Framework of National Curriculum*. Govt. of India, New Delhi.

MHRD (2010c) *Notification No. SO 750(E) dated 2010, March 31 (Gazette No. 622 dated 2010, April 5 - Authorisation of NCTE to Lay down the Minimum Qualification for a Person to be Eligible for Appointment as a Teacher*. Govt. of India, New Delhi.

MHRD (2013) *D.O. No. 12-2/2012 EE II dated 8 October, 2013 on Special Training Arrangements for Out of School Children*. Govt. of India, New Delhi.

MHRD (2017) *Notification No. GSR 155 (E) dated 20<sup>th</sup> February, 2017 (Gazette No. 127 dated February 22, 2017) Amendment in the Right of*

- Children to Free and Compulsory Education Rules, 2010*. Govt. of India, New Delhi.
- MLJ (Ministry of Law and Justice) (2002) *The Constitution (86<sup>th</sup> Amendment) Act 2002*. Govt. of India, New Delhi.
- MLJ (2009) *The Right of Children to Free and Compulsory Education Act, 2009 – No. 35 of 2009 (Gazette No. 39 dated August 27, 2009)*. Govt. of India, New Delhi.
- Mohanty, S. B. (1980) A day in a British primary school at Linlithgo. *Educational India* 17, 1, 11-12, July.
- Mohanty, S. B. (2016) Yoga education for all. *University News* 54, 36, 10-15, September 05-11.
- MWCD (Ministry of Women & Child Development) (2013) *The National Policy for Children 2013 (Published in Gazette of India, Part I Section I, 11 May 2013)*. Govt. of India, New Delhi.
- MWCD (2017) *Integrated Child Development Services (ICDS) Scheme*. Govt. of India, New Delhi.
- National Association for Year-Round Education, US. Available at <http://www.nayre.org/>
- NCERT (2005) *National Curriculum Framework 2005*. Author, New Delhi.
- NCTE (1998) *Curriculum Framework for Teacher Education*. Author, New Delhi.
- OECD (2016a) *PISA 2015 Results (Volume I): Excellence and Equity in Education*. OECD Publishing, Paris. Retrieved from <http://dx.doi.org/10.1787/9789264266490-en>
- OECD (2016b) *PISA 2015 Results (Volume II): Policies and Practices for Successful Schools*. OECD Publishing, Paris. Retrieved from <http://dx.doi.org/10.1787/9789264267510-en>
- OECD (2017) *PISA 2015 Results (Volume III): Students' Well-Being*. OECD Publishing, Paris. Retrieved from <http://dx.doi.org/10.1787/9789264273856-en>
- The Open University (2013) *Becoming a Teacher*. Author, Milton Keynes. Retrieved from [http://www3.open.ac.uk/study/atoz/recognition-leaflets/Becoming\\_a\\_teacher.pdf](http://www3.open.ac.uk/study/atoz/recognition-leaflets/Becoming_a_teacher.pdf)
- Planning Commission, India (2012) *Twelfth Five Year Plan (2012–2017) Social Sectors Vol. III*. Govt. of India, New Delhi.

Schwille, J.; Dembele, M., & Schubert, J. (2007) *Global Perspectives on Teacher Learning: Improving Policy and Practice*. Author, Paris. Retrieved from <http://unesdoc.unesco.org/images/0015/001502/150261e.pdf>

*The Times of India* (2017 April 22) Chennai Edition. p.6

UN (2015) *Message of Secretary General of UN for International day of Yoga on 2015, June 21*. Author, New York. Retrieved from <http://www.un.org/en/events/yogaday/message.shtml>

UNESCO (2016) *Education 2030: Incheon Declaration and Framework for Action -Toward Inclusive and Equitable Quality Education and Lifelong Learning for All*. Author, Paris. Retrieved from <http://www.uis.unesco.org/Education/Documents/incheon-framework-for-action-en.pdf>

US Office of Assessment, Research, and Data Analysis (2012) *What the Research Says About Alternative Teacher Certification Programs*. Author, Miami. Retrieved from <http://files.eric.ed.gov/fulltext/ED536506.pdf>

*The Times of India* (2017 April 22) Chennai Edition.

UN (2015) *Message of Secretary General of UN for International day of Yoga on 2015, June 21*. Author, New York. Retrieved from <http://www.un.org/en/events/yogaday/message.shtml>

UNESCO (2016) *Education 2030: Incheon Declaration and Framework for Action -Toward Inclusive and Equitable Quality Education and Lifelong Learning for All*. Author, Paris. Retrieved from <http://www.uis.unesco.org/Education/Documents/incheon-framework-for-action-en.pdf>

UNESCO (2017) *Sufficiency, Equity and Effectiveness of School Infrastructure in Latin America According to TERCE*. Author, Santiago. Retrieved from

<http://unesdoc.unesco.org/images/0024/002475/247571e.pdf>

US Office of Assessment, Research, and Data Analysis (2012) *What the Research Says About Alternative Teacher Certification Programs*. Author, Miami. Retrieved from <http://files.eric.ed.gov/fulltext/ED536506.pdf>

---

Sunil Behari Mohanty, Editor, JAIAER, Flat 1, Beatitude Apt.2, 61B Selvaraj Chettiar Street, Vaithikuppam, Puducherry-605 012  
E-mail: [sunilmohanty@gmail.com](mailto:sunilmohanty@gmail.com)

***Journal of All India Association  
for Educational Research  
Vol.28, No. 2, June 2016, 18-41***

## **NURTURING CREATIVE THINKING**

Panagiotis Kampylis, Research fellow, European Commission, Joint Research Centre, Institute for Prospective Technological Studies (Information Society Unit).

Eleni Berki, Senior University Researcher, University of Tampere, School of Information Sciences, Finland

### **INTRODUCTION**

An agricultural example<sup>1</sup> shows that helping people flourish is an organic and unpredictable process. Like a farmer sowing seeds, someone creates conditions for children to grow as creative and critical thinkers. Creativity cannot be taught ‘directly’, but educational practice can provide the means, opportunities and a fertile environment for the creative mind to flourish.

We use the term ‘creative thinking’ in this booklet (rather than ‘creativity’) because creative thinking: (a) is the prerequisite for *any* creative process, output and outcome; (b) presupposes the active and *intentional* involvement of the person(s) who create(s); (c) can be fostered by *appropriate* education. Creative thinking is defined as the thinking that enables students to apply their imagination to generating ideas, questions and hypotheses, experimenting with alternatives, and to evaluating their own and their peers’ ideas, final products and processes.

Everyone has creative thinking skills and ideas, but children have more because they are not yet fully aware of rigid logic and convergent views.

They are divergent, open, inventive and playful, which are features of creativity. Adults can also demonstrate their creativity, though it is suppressed through work and education. In principle, everyone can be(come) creative! Three factors contribute to be(com)ing creative: *skills, environment (including means) and motivation.*

In the following chapters, we consider all these factors in a (creative) learning space and in a school curriculum that enhances creativity. We analyse and emphasize the following three main points:

- all school subjects are creative and can be taught and learnt creatively;
- all environments can create and offer multiple, albeit very different, opportunities for students and teachers to reflect creatively; and
- all teachers, like all people, can be creative in their teaching practices.

The fostering of creative thinking is not always easy, and some advice from research, experience or guidelines from successful practice may be necessary. This booklet presents eight points taken mainly from three sources: (a) research on creativity recommendations; (b) research on classroom practices; (c) the authors' own experiences. We offer simple guidance on school activities that enhance creativity and creative thinking in different school and learning spaces world-wide, as we firmly believe that practice drives research and theory. That is, focusing on improving practice uncovers the best specific ideas. What you learn along the way can be tested in the light of broader research; but practice – not research – should be the driver. With this in mind, the eight chapters of the booklet try to:

- provide evidence on human creativity through good/suitable examples;
- emphasize practical implications; and,
- highlight good practice(s) and recommend activities to nurture

creative thinking.

The booklet contains eight key principles of creative thinking in no particular order of priority and with no hierarchical structure in mind. They are interlinked and interrelated and equally important for nurturing creativity in the educational context.

In order to nurture creative thinking in students effectively, we must re-think schooling and reflect on how new educational futures could be outlined by re-examining the following:

- what students learn (e.g. a diverse range of skills and subject content following their own learning pathways);
- how they learn (e.g. learning approaches and methods such as problem-based learning, constructivism, self-organized learning, instructional design, game-based learning);
- where they learn (e.g. in any location within school buildings–foyers, lounges, common spaces and corridors–home, a youth club, or indeed in the street);
- when they learn (e.g. after formal school hours and at any age);
- who they learn with (e.g. not only with teachers and classmates, but also with a range of other people, such as peers, experts, and people near to or far from them, and by themselves with self-organized learning methods, etc.); and
- for whom and why they learn (e.g. not just for themselves or for future employers, but also for their fellow citizens, society and industry, and for the world as a whole).

**Author's Note and Acknowledgements:** The authors would like to thank Stella Vosniadou, Maria Theodorakopoulou, Juri Valtanen and Antonis Bessios for their valuable feedback on early versions of this booklet and Patricia Farrer for the proofreading. The views expressed in this article are purely those of the authors and they should not be regarded as the official position of the European Commission.

## **1.CREATIVITY CAN BE PROMOTED THROUGH ALL SCHOOL SUBJECTS**

*Students' creative thinking can be nurtured in all school subjects and curriculum areas, and especially in cross-curricular activities.*

### **Research findings**

Creativity is not only a privilege of the arts or people associated with the arts. Creative thinking can also be fostered and demonstrated in all school subjects and curriculum areas. Even trivial subject-specific content can nurture creativity in students, provided that the pedagogical approach allows for the expression of creative thinking and imagination.

One of the main barriers to creativity in schools is the heavily charged curriculum. We need to rethink the traditional division of school subjects and skills, and design a more flexible, balanced and less-extensive curriculum with a provision for diverse and cross-curricular activities, such as projects, school blogs or magazines. Cross-curricular activities could nurture creative thinking and learning, but they require close collaboration between students and teachers with different backgrounds, knowledge, competencies and expertise.

### **Application in practice**

Even the most detailed and traditional curricula do not tell teachers exactly how to teach, and they do not prevent students from participating in cross-curricular or other types of learning. Therefore, from the creativity perspective, there is still considerable freedom for teachers to decide for themselves what and how they teach creatively. Often original explanations of facts and challenging comments on traditional knowledge by themselves can be creative ways of viewing otherwise non-creative subjects. These and other forms of student participation should be encouraged because they can be eye-openers and could lead to non-conventional ways of thinking.

The following are some ideas for teachers who want to teach creatively in all school subjects:

- *Mathematics:* you can help your students to develop their problem-finding and problem-solving skills, and mathematical competence through creative and authentic activities. For example, students could carry out a survey on the use of personal devices such as mobile telephones, computers or games among the members of the school community and create a report with tables and charts that could be published in the school newspaper or blog. Playing with cards, configuration games such as tangrams and other toys and observing other everyday practices can also be used for creative learning, if these activities are used to engage the students and are integrated into the mathematical exercises.
- *Science:* you can encourage students to experience science not as a set of facts but as a creative endeavour for understanding nature. For example, you can ask students to experiment with paper airplanes and report on the effects that their size, shape and material have on how they fly. Or, you can investigate basic science concepts such as forces by using playground equipment (e.g. seesaws and spring riders) or buoyancy through plastic toys.
- *History:* History can be studied as an exciting adventure that triggers students' imagination and connects the past with the present. For instance, starting from school history (e.g. searching the school archives for information about its foundation, ex- students and teachers, and the development of school premises, etc.), students can study local history and how it reflects specific historical periods. You should use open-ended questions and tasks as far as possible, e.g. 'what information could our school building provide for future historians?'
- *Geography:* Geography can contribute to the development of a range of creative thinking skills through open-ended and meaningful activities. This type of question can elicit creative thinking, raise awareness of global issues and create environmental



consciousness: for example ‘How can we show what our locality is like to people from another city or country?’,

‘What can we do to help protect our local environment?’, ‘What do maps tell us about life in X place?’

**Suggested readings:** Fisher & Williams, 2004; Kampylis, Berki, & Saariluoma, 2009; Starko, 2010.

## **2. INFLUENCE CREATIVE THINKING THROUGH WELL-DESIGNED LEARNING SPACES**

*The way space is designed has a significant impact on creative thinking and learning. Learning spaces can bring people together and encourage their interaction and creative collaboration.*

### **Research findings**

The way in which space – physical or virtual – is designed can deliver unspoken messages about the dominant teaching and learning practices, and also shape and influence the learning that happens in it. It can, furthermore, influence creative thinking.

Sometimes even trivial details – such as furniture arrangements, the materials used and the technologies available – are instrumental in achieving positive learning experiences that can determine students’ learning outcomes, while ensuring the well-being of students and teachers.

Inspired by evidence-based research on the impact of lighting, noise, furnishing, ventilation and indoor air quality, as well as by the principles of socio-constructivism, we can (re)design and (re)arrange space to take advantage of colour, light, sound, shapes and materials. Thus, collaboration and co-construction of knowledge is allowed, the possibility of thinking differently is opened up and innovative teaching is facilitated.

### **Application in practice**

Even in a typical school with ‘standard classrooms’, teachers can work out creative arrangements for a variety of working spaces that encourage the active involvement of students. The following suggestions could help you achieve this:

- Design with *your* students two or three basic classroom arrangements, e.g. for whole class lessons, for teamwork or project-based activities, and for independent work. These arrangements should demand little time and the minimal moving of furniture. Students themselves can be empowered to make the changes and the transitions. Although these changes can cause momentary chaos, they also allow for creative teaching and learning practices.
- Use ‘pigeon hole’ units, individual pocket folders, or other communication means that allow you to provide your students with individual assignments, reading materials, comments, etc., without wasting a lot of time passing out papers.
- Experiment with everyday materials in order to transform the classroom into a creative learning place. For instance, try re-using cardboard boxes on a table to re-create carrel desks (small individual high-sided desks), as an alternative way to encourage independent study, when needed.
- Utilize new technologies in an innovative and cost-effective way to transform even the most conventional school buildings into stimulating learning spaces. For instance: (a) use video projectors to create inspiring and easily adaptable physical spaces by projecting powerful images and/or texts onto school walls; (b) ‘take the class on a trip’ to any location in the world through the Internet; or (c) run experiments through online laboratories<sup>2</sup> without leaving the room. In the absence of new technology, try to use older learning technologies, e.g. geographical wall maps, drawings and images produced by the students, etc. Or you can hold the lesson in several different ways, and afterwards compare and contrast the effectiveness and pleasure in teaching and learning.
- Discover alternative learning spaces to the classroom, either inside (e.g. a corridor, the school garden, etc.) or outside the school premises (e.g. a youth club, a park, etc.). Then, with one or more colleagues, co-organize a creative, project-based activity, involving mixed-age groups of students. Observe and monitor any

differences you see in students' involvement and interaction related to the new learning arrangements.

**Suggested readings:** Burke, 2007; Oblinger, 2006; Rudd et al., 2006; UNESCO, 2012.

### **3. INCREASE THE USE OF OPEN-ENDED QUESTIONS**

*Open-ended questions help students develop creative thinking by applying, analysing, evaluating and synthesizing information and knowledge.*

#### **Research findings**

Teachers spend a great deal of their time asking students questions. Many different types of questions are used, but the main distinction is between closed questions and open-ended questions. Closed questions can be used to test comprehension and to aid retention of information (e.g. what is the capital city of India?). Open-ended questions have many possible answers that are not pre-determined (e.g. what if we had gills?). Open-ended questions can promote creative thinking and learning because they require students to find, combine and criticize information instead of simply recalling facts. Research shows that on average, approximately 60% of the questions asked in classrooms are closed-ended, 20% are procedural, and only 20% are open-ended.

One of the most ancient and effective questioning frameworks is Socrates' maieutic method, which highlights the importance of questioning in deep and active lifelong learning. Socratic questioning differs from random open-ended questioning in the sense that it is planned, disciplined and deep; the questions are selected to probe reasons and assumptions in order to engage in higher levels of thinking progressively – including analytical, critical and creative thinking.

#### **Application in practice**

It is a real challenge for teachers to develop a well-planned questioning method that encourages the active involvement of students and

facilitates creative thinking. The following are some suggestions on how you could do this:

- Try novel ways of involving all students in asking and answering questions. For example, ask students to raise one green card when they agree and a red card when they disagree with the answer that someone else has given. Start first with closed-ended questions and go progressively to open-ended, higher-order questions.
- Focus on the actual experiences and thoughts of the students, rather than on what they have read or experienced second hand, by asking:
  - Questions that seek clarification: e.g., ‘Could you explain further?’, ‘Can you give an example/counter example of ...?’
  - Questions that challenge assumptions: e.g. ‘What do you think is behind this assumption here?’, and ‘Is this always the case?’
  - Questions that probe reasons and evidence: e.g. ‘Why do you say that?’, ‘How do we know that ...?’, ‘Is/are there any reason(s) to doubt this evidence?’
  - Questions that explore alternative viewpoints: e.g. ‘What is the counter argument for X?’, or ‘Can/did anyone see X in another way?’
  - Questions that look for implications and consequences: e.g. ‘But if X happened, what else would could result?’, ‘How does X affect Z?’
  - Questions about the question: e.g. ‘Why do you think that I asked that question?’, or ‘Why was that question/problem important?’
- Simply asking more open-ended questions does not necessarily lead students to produce higher-order responses; so, increase the wait-time for answers as much as possible and create a positive climate by tolerating ambiguity and encouraging original responses.
- Ask students, whenever you can, to explain how their answer emerged (e.g. based on their prior knowledge or experience; inspired by a similar situation (analogy), etc.).

- Always encourage and treat students' questions with respect and interest; in other words, try to reward and assess not only their answers to your questions but also the questions they formulate/pose themselves.
- Scrutinize your questioning technique(s) by audio or video-recording a number of your classes or by asking a colleague to observe you. Keep track of the percentage of closed- and open-ended questions you use, the students you question each time and the type of questions you use for each of them, etc. Reflect on the patterns of questioning you are using and check if they promote creative and critical thinking.
- Try to find a better balance between oracy (e.g. dialogues and arguments) and literacy (e.g. written texts and online sources), and use both written and oral examinations for assessing students.

*Suggested readings:* Cotton, 1989; Fries-Gaither, 2008.

#### **4. ENGAGE LEARNERS IN MEANINGFUL AND AUTHENTIC ACTIVITIES**

*Learners are most creative when they are involved in meaningful, challenging and authentic activities; these are more likely to generate interest and engagement.*

##### **Research findings**

Learning and creativity are the outcomes of hard work, determination and persistence. Even when students have the potential to learn and/or create something, they still need the incentives to do so. Individuals who are intrinsically motivated tend to be more willing to spend the required time and energy to be creative than the individuals who are driven by external rewards, pressures and inducements. Students are more likely to express their creative potential when they are involved in meaningful and authentic activities that fit their personal interests and abilities, and are also intellectually challenging.

### **Application in practice**

- Find out through conversation, questioning, etc., what arouses the interest and motivates your students, as well as what they already know.
- Use the above-mentioned information for designing meaningful activities and authentic tasks of different types (visual, auditory, kinaesthetic) that motivate all students and increase their engagement. Always take into account gender and individual differences, learning styles, and cultural and socio-economic background.
- Allow students to have personal choices and contribute to decisions that relate to their own learning. Take their suggestions and feedback on the selected activities and tasks seriously.
- Consider students' close friends' interests and hobbies, too! Friends at that age influence each other's learning a lot through their personal preferences and occupations.
- Offer, whenever possible, authentic learning opportunities to students and try also to involve others, e.g. experts, subject specialists, artists, parents, other teachers, etc., in order to stimulate interest and ensure engagement.
- Take advantage of the available open educational resources (such as lesson plans, simulations, quizzes and e-books that can be modified, reused, repurposed and shared) and align them according to the needs, interests and prior knowledge of your students.
- Remember that, in order to advance effective creative thinking in students, the teaching approach is far more important than the content of the activity itself. Even trivial content can activate creative thinking, provided that the pedagogical pursuit allows for idea generation, recreation, experimentation and sensible risk-taking.
- Ask your students to follow a local newspaper or the municipality portal for one or two weeks, until they find real world problems, news and situations that capture their personal interest. Ask them to formulate a problem, connecting it with specific curricular areas. The formulation of a problem is very often a more creative process than its solution; raising new questions and new possibilities, while looking at old

questions from a new angle requires pure creative thinking.

- Ask students to investigate these and other problems while working in small groups that they have formed themselves according to their preferences, in order to propose creative solutions, such as a written report, a blog post, a presentation for all, etc. Help them to understand that real-life problems can have multiple and diverse solutions. This can reveal the students' own creative potential!

**Suggested readings:** Amabile, 1996; Kamylyis, 2010; Starko, 2010; Vosniadou, 2001.

## **5. COLLABORATION ENHANCES CREATIVITY**

*Motivation, insights and novel ideas arise mainly during our interaction with others.*

### **Research findings**

Collaboration develops the students' ability to think both independently and with others, enabling them to consider a wide range of perspectives and, thus, increasing their creativity potential. In this sense, creative thinking is not only a characteristic of individuals but also the property of groups of individuals. Original products are created not only by individuals, but also by groups, organizations, communities and even by entire societies.

Several terms, such as group/team creativity and collaborative/collective creativity, are used to describe the common efforts of two or more individuals to achieve an innovative outcome that cannot be achieved by a single individual alone. Researchers agree that there are significant differences, but also interrelations between individual and collective creativity. Therefore, in order to explain collective creativity it is not enough to study individual creativity. We must also consider the role of each individual in a group, the group dynamics, and the socio-cultural and environmental factors, which are nowadays considered far more important than before in creativity pursuits.

### **Application in practice**

Creative teachers can encourage collaboration and facilitate students' collective creativity by:

- Emphasizing the roles of the individual and of the collective (group effort) in creativity. For example, you can ask students to list a number of inventions (in the history of science) and/or discoveries (in history or geography), and ask them to analyse them and determine if they were the outcomes of individual or collective efforts.
- Engaging students in reflections about the role of others, such as peers, teachers and parents, in their own creative achievements.
- Acknowledging that cultural diversity is an opportunity for learning in general and for creativity in particular. Formulating mixed groups of students with diverse backgrounds, interests, prior knowledge, abilities and learning styles ensures the plurality of thinking within the group and the possibilities for collaborative creativity.
- Providing students with as many opportunities as possible to collaborate with peers (virtually and face-to-face) and those beyond the classroom – such as experts and artists – in order to bring creative projects to a successful conclusion.
- Helping students to set up and run their own clubs, such as science clubs, school magazine editorial teams, school blog teams, school bands, theatre groups and dance ensembles in order to give them numerous opportunities to collaborate creatively. Other groups can also be planned and formed to accommodate other interests and activities, focusing on nature, mathematics, computers, literature/poetry reading, writing, broadcasting, etc.
- Understanding that collective creativity raises a range of issues, including peer-to-peer equality. The creative-thinking process must be productive *for all* students and allow them to express their multiple intelligences and interests. Everyone has the right to creative learning and self-expression, and also the duty to respect the same rights for others.
- Helping students to understand that not all collaboration leads to creativity. Effective collaboration for creativity expression needs to have some element of structure and continuous encouragement and facilitation by suitably trained teachers.



**Suggested readings:** Miell & Littleton, 2004; Sawyer, 2012; see also Bertolt Brecht's poem *Questions from a Worker Who Reads* (<http://bit.ly/12V8QPB>)

## **6. MAKE EFFICIENT USE OF TECHNOLOGIES**

*Educational technologies enable communication and collaboration, and open up a range of profoundly new ways of using and creating information and knowledge inside and outside the school.*

### **Research findings**

Information, communication and collaboration are at the core of the educational process, and the rapidly evolving related technologies and applications (information and communication technologies – ICTs) have influenced, and often transformed, the ways we think, learn, communicate and create knowledge. ICTs encourage creative processes as they allow information to be represented in a variety of modes, which other media and tools cannot offer. They therefore support a diversity of learning styles. Thus, they enable learners to retrieve, evaluate and synthesize information, try out creative ideas, explore alternatives and solve problems in a personalized and active way.

ICTs have great potential for dissolving the boundaries between learning in and outside schools, for re-engaging marginalized learners and for motivating students and teachers. ICTs are used more effectively and creatively in schools when: (a) the students are in 'control' of learning (personalized learning); (b) peer learning and collaboration are facilitated; (c) feedback and assessment are optimized; (d) there is a diversity of teaching and learning strategies; and (e) teachers are pre-trained in their use as teaching and learning tools. Nowadays, there is a consensus among researchers and educational stakeholders that the process of using technology to facilitate creativity in thinking and practice is not merely a technical matter. It is, mainly, a matter of adopting innovative pedagogical practices that utilize the existing and emerging technologies in a student-centred context for developing both creative thinking, and twenty-first century skills and competences, such as self- and peer-assessment, problem-finding and problem-solving,

inquiry, communication and collaboration.

### **Application in practice**

What can teachers do to take full advantage of the potential of ICTs to encourage creative thinking and twenty-first century skills?

- You can use available ICT tools (e.g. online social networks) for opening up new ways for learners to collaborate, communicate and connect with creative ideas, and people beyond time and school borders.
- You can help students to understand that creative use of ICTs offers opportunities for supporting the democratic decision-making processes and strengthens representative democracy. For instance, you can provide concrete examples that illustrate the power of individual contributions to bring about large-scale changes at the local, regional, national and/or international levels.
- You can use available technologies for ‘flipping’ teaching<sup>3</sup> and learning routines so that you can spend more time interacting with students instead of lecturing. For example, you can use videos and online resources with the lecture and/or learning materials that students can access and study outside of class time. This flipping allows time during the class to be used more effectively for additional learning-based activities, differentiated instruction and collaborative learning.
- You can take advantage of the educational activities (e.g. virtual tours), programmes (e.g. open online courses), resources (e.g. online videos), and applications (e.g. games) that are offered – usually free of charge – by institutions such as libraries, science centres, museums, zoos, non-governmental organizations, foundations, universities, corporations and so on, for developing engaging, amusing, meaningful and authentic learning activities inside and outside school.
- You can improve students’ ability to transfer the creative and active ways (e.g. trial-and-error and learning-by-doing) they use when interacting with ICT devices and applications (such as games) to other situations inside and outside the school.
- You can use a great variety of digital resources, such as e-books,

maps, illustrations, audios, videos, infographics, animations, simulations, games and 3D applications to trigger students' interest and increase their participation.

**Suggested readings:** Bocconi, Kampylis & Punie, 2012; Cachia et al., 2010; Craft, 2012; Loveless, 2008

## **7. ALLOW FOR MISTAKES AND SENSIBLE RISK-TAKING**

*Create a caring and encouraging learning environment where students feel free and safe to experiment with new ideas and take sensible risks.*

### **Research findings**

Failure is an 'integral' part of the creative process and creative people often have many failed ideas or products before finding their successful ones. The creative process is inherently risky, and risk-taking is among the key characteristics of a creative personality.

Unfortunately, teachers tend to minimize failure of all types. A recent study on creativity and innovation in education in European Union Member States revealed that schools prefer discipline to playful and risk-taking behaviour. The emphasis on the 'correct response' reinforces students' fears of making mistakes and this is one of the most widespread educational practices that inhibit creativity. As a result, students are not willing to take risks within school. They prefer to 'play it safe' and provide teachers with one 'correct response', instead of trying to explore more ideas and alternatives.

Teachers' willingness to allow their students to take risks, to explore and experiment is related positively to students' creative learning. In order to foster creativity, schools could try reinforcing a 'culture of tolerance' that encourages 'sensible risk-taking' by teachers and students.

### **Application in practice**

You could try to create a secure and supportive learning environment where students feel safe enough to try new things and are not afraid to

make mistakes or fail. The ownership of the activities (and outcomes) should lie with the students, allowing them to make high (strategic) level choices related to non-predetermined options leading to creative and unpredictable rather than predictable outcomes.

When planning in order to encourage creativity, you can consider the following:

- Act as role models for creativity by taking sensible risks, trying new things and adopting innovative teaching practices.
- Allow students the freedom to play with ideas and take sensible risks, while engaging in challenging and controversial issues from real life.
- Allow space and time for students to try new things and learn despite the pressures of assessment.
- Encourage initiatives linked to risk-taking and creative thinking, and take them into account in students' final assessments.
- Give students the opportunity to carry out peer reviews of materials where errors were made in order to help them recognize mistakes and reflect upon them.
- Engage students in problem-based and meaningful activities that allow experimentation, sensible risk-taking and learning through trial and error, discussion, argumentation and debate.
- Recognize, accredit and reward any prior experiential and/or informal learning that happens outside classroom through learning-by-doing and through trial-and-error.
- Provide students with role models of successful risk-taking, tolerance of ambiguity and continuous creative efforts in order to avoid linking a single failure with total failure.
- Ask the students to create a bulletin board, a presentation or an essay of 'Great Failures(?)' in order to understand that failure is an 'integral' part of any creative process and that creative efforts are not always accepted at the time they are initiated.<sup>4</sup>
- Ask students to reflect on their own past failures and current mistakes

while trying new and creative endeavours, and observe the way they reflect and comment on them. Reward this reflection in the final assessment procedure.

**Suggested readings:** Blair & Mumford, 2007; Cachia et al., 2010; Craft, Cremin & Burnard, 2008; Sternberg & Williams, 1996.

## **8. LEARN HOW TO ASSESS AND REWARD CREATIVITY**

*Creative thinking can be evaluated by student-centred and reflective means of assessment which take into account both the learning processes and outcomes.*

### **Research findings**

Some assessment methods tend to foster creativity while others tend to inhibit it. Traditional assessment methods that focus on remembering facts do not usually take into account students' creative thinking. Instead, they encourage the avoidance of mistakes and risk-taking, knowing how to achieve the highest grades, and demonstrating one's abilities and skills in relation to others. On the other hand, formative assessment practices provide students with information and feedback on how they are progressing, considering their own prior achievements according to their own learning goals, and are better at fostering creativity than the summative ones. This is because they allow students to understand which skills they need to develop further and which content areas they need to improve. Formative assessment practices include self-assessment, peer feedback, learning diaries, portfolios, e-portfolios and presentations. In addition, these types of assessment can cover both individual and collaborative efforts, and creative group work, such as projects.

When students feel pressured by evaluative surveillance, monitoring and other major features of assessment, their willingness to take risks and explore creativity becomes limited. But when assessment is constructive and focuses on self-improvement, the students are more likely to take risks, seek out challenges, and develop and contribute ideas that are both novel and useful.

### **Application in practice**

- Explain to your students why it is important to build their assessment on strengths and self-improvement and not on weaknesses and competition. Help them to focus on things they feel proud of; something they can do for the first time; something they feel they have improved at; something that was a challenge for them.
- Co-create with students a checklist or a matrix that will allow them to evaluate their own work (self-assessment) in a creative assignment that examines both the process and the outcome of learning according to several criteria, such as originality, novelty, appropriateness, completeness, elegance and consistency.
- Ask students to test each other (and you!) and give each other constructive feedback (peer-assessment) according to some pre-determined, well-accepted and comprehensible criteria, such as the ones mentioned above.
- Inform parents and other interested groups about the importance of also assessing creative thinking in order to avoid misunderstandings and resistance on their part about changing the traditional assessment practices.
- Encourage students through formative assessment feedback to take sensible risks, express creative thinking and share their ideas or adapt them to a different context (transferability).
- Motivate the students not by suggesting that their creative efforts will be credited and graded, but by pointing out the features of the task that are interesting to them. Help them to set challenging but realistic goals, both as individuals and as a team, and to find personal meaning in the task by providing a greater level of choice about how to complete it.
- Try to ensure that even summative assessment results are informative and useful. For instance, rather than congratulate the students who got 'A' on a test, as though the 'A' itself was the goal, comment on the high level of competence this grade signifies. Accordingly, help students to *understand that low grades are not a kind of punishment, but an indicator* that the student needs to exert more effort or needs more time or some assistance.

- Reduce the stress and anxiety that very often accompany assessment, particularly during the divergent phases of the creative process when students need freedom and comfort to generate and explore novel ideas. Try to provide constructive feedback – not criticism – at the early stage of idea generation.

***Suggested readings:***

Beghetto, 2005; Cropley, 2001; Lucas, Claxton & Spencer, 2013; Villalba, 2009. See also a short video related to children's creativity and its 'assessment' at <http://bit.ly/16NqRVS>.

## **CONCLUSION**

This booklet emphasizes activities and learning tasks that enhance creativity. Opportunities for engaging learners in meaningful, authentic and creative subject activities can be found in *all* school subjects, in new and old learning spaces, and through collaboration and efficient use of educational technologies. Important principles for creative and critical thinking are the use of *open-ended questions*, the *allowance for mistakes* and sensible *risk-taking*. Assessing and rewarding creativity is an important component for appreciating and encouraging creativity.

Creativity is an attitude to change. A flexible and practical mind, willing to play with forms and ideas and turn them upside down in order to achieve a better future, is a creative mind. Creating and enjoying a good life, while looking for ways to improve it through problem-solving, is a habit of the human mind. The eight principles in this booklet offer a comprehensive guide for creative education. Democratic (all forms) creativity is a remarkable pedagogical innovation, but it is not always possible or desirable. Often, creative thinking for finding and solving problems and the adoption of creative learning paradigms are deliberately avoided. Teachers and students can and should, alone and/or with collaborators, find innovative methods and ideas and carry

them out, even within the constraints of their learning spaces.

With or without advanced ICTs, multidisciplinary curricula and imaginative approaches, education at all levels should aim to nurture manifold (*creative, critical, caring and reflective*) thinking. This booklet targets teachers who, as role models of creative thinking, can use pedagogic techniques and cross-curricular activities to trigger the manifold thinking process. It will benefit the human mind and society to get as many wide-ranging thinkers as possible involved in a wide variety of ideas, knowledge and citizenship responsibilities. The main function of school is educating and preparing young people for the future. This future should be personally pleasant and fulfilling, and enable young people to make a meaningful and positive contribution to society. Manifold thinking for creating, communicating, integrating, acting ethically on knowledge and critically evaluating its effects and impact on other humans and the society can offer a holistic educational practice.

One should question: (a) what is the meaning of learning in the modern world? and (b) how can you achieve it creatively? – and why? Learning should lead to wellness of being and ‘human flourishing’ (*εὐδαιμονία*), with teachers as mentors of learning and creativity.

**Suggested readings:** Valtanen et al., 2008.

**REFERENCES** (*Reference styles as provided in original publication are not of JAIAER*)

- Amabile, T. (1996). *Creativity in context*. Boulder, CO: Westview Press.
- Beghetto, R.A. (2005). Does assessment kill student creativity? *The educational forum*, 69(2), 254–263.
- Blair, C.S.; Mumford, M.D. (2007). Errors in idea evaluation: Preference for the unoriginal? *Journal of creative behavior*, 41(3), 197–222.
- Bocconi, S.; Kampylis, P.; Punie, Y. (2012). *Innovating teaching and learning practices: Key elements for developing creative classrooms in Europe*. Luxembourg:



- Publications Office of the European Union. (JRC 72278.)
- Burke, C. (2007). Inspiring spaces: Creating creative classrooms. *Curriculum briefing*, 5(2), 35–39.
- Cachia, R. et al.. (2010). *Creative learning and innovative teaching: Final report on the study on creativity and innovation in education in EU member states*. Luxembourg: Publications Office of the European Union. (JRC 62370).
- Cotton, K. (1989). *Classroom questioning*. Portland, OR: Northwest Regional Educational Laboratory. (School Improvement Research Series.)
- Craft, A. (2012). Childhood in a digital age: Creative challenges for educational futures. *London review of education*, 10(2), 173–190.
- Craft, A.; Cremin, T.; Burnard, P. (Eds.). (2008). *Creative learning 3-11 and how we document it*. Stoke-on-Trent, UK; Sterling, VA: Trentham.
- Cropley, A.J. (2001). *Creativity in education and learning: A guide for teachers and educators*. London: Kogan Page.
- Fisher, R.; Williams, M. (Eds.). (2004). *Unlocking creativity: Teaching across the curriculum*. London: David Fulton.
- Fries-Gaither, J. (2008). *Questioning techniques: Research-based strategies for teachers*. Available online at <http://bit.ly/18hnmo3>
- Kampylis, P. (2010). *Fostering creative thinking: The role of primary teachers*. Jyväskylä, Finland: University of Jyväskylä. (Jyväskylä Studies in Computing no. 115, S. Puuronen, Ed.)
- Kampylis, P.; Berki, E.; Saariluoma, P. (2009). In-service and prospective teachers' conceptions of creativity. *Thinking skills and creativity*, 4(1), 15–29.
- Loveless, A.M. (2008). *Creative learning and new technology? A provocation paper*. In: J. Sefton-Green (Ed.), *Creative learning* (pp. 61-72). London: Arts Council England.
- Lucas, B.; Claxton, G.; Spencer, E. (2013). *Progression in student creativity in school: First steps towards new forms of formative assessments*. Paris: OECD Publishing. (OECD Education Working Papers, no. 86.)
- Miell, D.; Littleton, K. (Eds.). (2004). *Collaborative creativity: Contemporary perspectives*. London: Free Association Books.
- Oblinger, D. (Ed.). (2006). *Learning spaces*. Boulder, CO: EDUCAUSE.
- Rudd, T. et al.. (2006). *What if... Re-imagining learning spaces*. Bristol, UK: Futurelab.

- Sawyer, R.K. (2012). *Explaining creativity: The science of human innovation* (2<sup>nd</sup> ed.). Oxford, UK; New York, NY: Oxford University Press.
- Starko, A.J. (2010). *Creativity in the classroom: Schools of curious delight* (4<sup>th</sup> ed.). New York, NY: Routledge.
- Sternberg, R.J.; Williams, W.M. (1996). *How to develop student creativity*. Alexandria, VA: Association for Supervision and Curriculum Development.
- UNESCO (United Nations Educational, Scientific and Cultural Organization). (2012). *A place to learn: Lessons from research on learning environments*. Montreal, Canada: UNESCO Institute for Statistics. (Technical Paper no. 9.)
- Valtanen, J. et al.. (2008). Manifold thinking and distributed problem-based learning: Is there potential for ICT support? In: M.B. Nunes; M. McPherson (Eds.), *Proceedings of the IADIS International Conference e-Learning 2008* (Vol. 1, pp. 145-152). Amsterdam: IADIS Press.
- Villalba, E. (Ed.). (2009). *Measuring creativity: Proceedings of the conference, 'Can creativity be measured?' Brussels, May 28-29, 2009*. Luxembourg: Publications Office of the European Union. (EUR 24033 EN.)
- Vosniadou, S. (2001). *How children learn*. Geneva, Switzerland: International Academy of Education (IAE)/International Bureau of Education (UNESCO/IBE). (Educational Practices Series, no. 7.).

## NOTES

1. [www.ted.com/talks/sir\\_ken\\_robinson\\_bring\\_on\\_the\\_revolution.html](http://www.ted.com/talks/sir_ken_robinson_bring_on_the_revolution.html)
2. Online laboratories are experimental facilities that can be accessed through the Internet, allowing students and teachers to carry out experiments from anywhere at any time. See, for instance, <http://ilabcentral.org/>—
3. See, for instance, [http://en.wikipedia.org/wiki/Flip\\_teaching](http://en.wikipedia.org/wiki/Flip_teaching)
4. For example, Edison's creative products, such as the ever-lasting light bulb, were not the outcome of single-try endeavours, but rather the result of multiple failures that Edison and his team analysed in a constructive way before achieving success

**Acknowledgement**

Nurturing creative thinking by Panayiotis Kampylis and Eleni Berki (Educational Practice Series 25 of the International Bureau of Education, Geneva, Switzerland) was produced in 2014 by the International Academy of Education (IAE), Palais des Académies, 1, rue Ducale, 1000 Brussels, Belgium, and the International Bureau of Education (IBE), P.O. Box 199, 1211 Geneva 20, Switzerland. The publication states that “It is available free of charge and may be freely reproduced and translated into other languages. Please send a copy of any publication that reproduces this text in whole or in part to the IAE and the IBE”

*Journal of All India Association  
for Educational Research*  
Vol.28, No. 2, December 2016, 42- 78

## **GUIDING PRINCIPLES FOR LEARNING IN THE TWENTY FIRST CENTURY**

Conrad Hughes, Director of Education, International School of Geneva, Switzerland.

Clementina Acedo, Director of Webster University Geneva, Switzerland.

### **INTRODUCTION**

The purpose of this booklet is to offer guiding principles about learning in the twenty-first century. It is intended for teachers, curriculum designers, school leaders, and others involved in all levels of school education and can be used for any age group, as the principles it contains are general enough to be applied in different contexts. The guide offers a bridge between classroom practice, educational theory, and academic research. It draws on theories developed by researchers and teachers, and on an article of the same title published in *Prospects* (2014), along with the expertise of educational organizations.

Historically, theories of learning, ideas about what we should teach, examples of practice, and suggested models have been developed separately by different organizations. The result has been a lack of unity, with little cumulative knowledge and an absence of cooperation on research. This guide attempts to address this lack of unity by responding to the question: What is it that students should be learning in the twenty-first century?

This challenge takes us back to a fundamental question about the purposes of education: What is education for? The subject areas traditionally taught in school (languages, humanities, natural sciences,

mathematics, technology, the arts, religious and physical education) are required by universities and are still relevant. However, there is increasing understanding that new areas of knowledge, competences, and behaviours need to be integrated into curricula if young people are going to function well in an increasingly complex global society. In the future, they may be faced with enormous challenges associated with poverty, overpopulation, and declining bio-capacity. For example:

- The International Education Advisory Board suggests that twenty-first century learning is and will continue to be linked to information technology;
- The Centre for Curriculum Redesign points to the need for a thorough review of the knowledge, skills, and character necessary for deep and relevant learning;
- The OECD's Programme for International Student Assessment (PISA) has identified the "need to assess problem-solving abilities as governments around the world seek to equip young people with the skills they need for life and employment" (Schleicher, 2011);
- UNESCO has stated that "concern for peace and sustainable development should be at the centre of our efforts to promote inclusive and equitable societal development" (UNESCO, 2013, p. 1).

What is clear is that learning in the twenty-first century involves numerous areas of human development. They go beyond skills and technology to cover all aspects of the social, psychological, and moral development of learners. Educational programmes are often expected to include sustainable development, learning to live together, intercultural understanding, communication skills, and the respectful attitudes towards others needed for genuinely inclusive and peaceful development. Due to this evolution, education may benefit from understanding how to go beyond traditional academic content.

This guide offers ten areas for learning that are particularly significant in the present world's educational climate, in which stability, predictability, and continuity are no longer guaranteed. On

the contrary, young people are entering a volatile, unpredictable, complex, and ambiguous world. These ten areas can be divided into:

- Core areas of knowledge (such as information literacy, concepts- focus learning, and STEM [science, technology, engineering and mathematics] learning) [sections 2, 5, and 6];
- Competences (such as critical thinking and creativity) [sections 3 and 4];
- Attitudes (associated with academic honesty, health and mindfulness, and service learning) [sections 1, 7 and 8];
- Broad approaches to learning (in areas such as learning support and assessment) [sections 9 and 10].

It is intended to stimulate meaningful reflection on education so that those who read it feel inspired to take up some of the suggestions and adapt them to the realities of their own classrooms. Although the use of these ideas will vary depending on the context, the underlying message will be the same: these guiding principles are essential for quality learning in the twenty-first century.

***Authors' notes and acknowledgements:*** This guide is the result of two years of brainstorming among the leaders of the International Bureau of Education and the International School of Geneva, as well as school teachers and academics from various institutions, such as Durham University, King's College, London, and the Centre for Curriculum Redesign. Students and parents of the International School of Geneva have also played a role in producing this work.

*Suggested Readings:* Acedo & Hughes, 2014; Coffield et al., 2004; Fadel, 2011; IAEB, 2013; Schleicher, 2011; UNESCO, 2013.

## **1. ACADEMIC HONESTY**

*Understanding and promoting values of academic honesty enables students to conduct independent research with confidence and integrity.*

### **Research Findings**

A quality education in the twenty-first century needs to address the affective disposition and ethical decision-making capacity of learners.

This includes their attitudes towards themselves, the community, and learning itself. The survival of the planet depends as much on ethics as it does on competences. A value-based education is particularly necessary in an age when ethical dilemmas are often either reduced to legal, technical questions in a secularised model — which runs the risk of sterilizing them — or radicalized through religious fundamentalist models where dogmatic moral absolutism is often cast over rational and empirical thought. The challenge facing schools in the modern era is to teach ethics without straying too far on either side of this spectrum.

Carrying out independent research is a core element of learning. When considering academic integrity in the twenty-first century world, it is important to take into account the opportunities and dangers that new technologies represent. Students are being taught to conduct research more efficiently by using databases and software functions rather than mere commercial search engines, while schools are revisiting the concepts of collusion and malpractice in the light of social media and the worldwide web. This is particularly salient in a digitised world, given that the concepts of plagiarism and intellectual property have been blurred by easy access to open source material, and few people really understand copyright infringement.

These concerns regarding academic integrity are relevant not only in schools that use technology in the classroom but also those where hardware or Internet access is scarce: students need to know how to deal with information ethically and safely, as these are issues they will face throughout their lives. It is important that students are given the technical means, understanding of the concepts, and the ethical foundations with which to conduct research with confidence and academic honesty.

### **Implications for Educators**

1. *Foster a deep understanding of academic honesty.* It is recommended that all students, teachers, and parents understand the concepts of “plagiarism”, “collusion”, “malpractice”, and “intellectual property”. These concepts can be repeated from the first years of schooling up until the final examinations in an appropriate

manner according to the age of the students. It is important that schools communicate these concepts to students in suitable ways, ensuring that there is a constant, open dialogue on academic honesty. Formative assessment, making learning visible, and reflection on the learning process reinforce academic honesty.

**2. *Design creative tasks to enhance academic honesty.*** The best way of avoiding academic dishonesty is to design tasks that require original and not reproductive thinking. Open-ended, creative tasks and learning experiences based on authentic, individual contexts will put students in situations where malpractice, collusion, and plagiarism are less likely to occur.

**3. *Require clear referencing.*** It is recommended that every school have clear guidelines on the way it requires students to cite the references they have used for their research. It is often the case that schools appoint curriculum coordinators who are responsible for the choices that students make about their research and the degree of consistency and clarity students receive on the matter.

**4. *Promote team work at the school level.*** The librarian in each school can work with teachers and coordinators to ensure that students' use of electronic and manual resources is ethical, informed, up-to-date, and productive. Schools can also use plagiarism-detecting software to screen students' work as appropriate. In cases where students are found guilty of academic dishonesty, it is important for the teacher involved in the incident and the relevant academic programme coordinator to meet with the student and the student's parents to discuss the issue and to ensure clear understanding of all aspects of the case.

**Suggested Readings:** Bertram Gallant, 2011.

## **2. INFORMATION LITERACY**

*Effective inquiry-based learning requires students who can utilize today's constant flow of information both confidently and fluently.*



**Research Findings**

Effective inquiry-based learning is a key twenty-first century competence, as it means detecting signals (important, salient information) from the surrounding noise in an age where the amount of data generated online is several quadrillions of bytes per day. One of the earliest theories of learning stated that learning should be relevant and situated within a meaningful, real-world context. This is based on the idea that we learn best when we can see the usefulness of what we learn and can connect it to the real world.

Today we know that the human mind thrives in highly complex polyvalent environments, implying that learners can cope with more than we previously thought they could. We also know now from extensive meta-analyses that teachers have the most important impact on learning and that pedagogical quality is a vital part of educational quality. In particular, research indicates that students can develop synthesising minds through well-designed courses in which they learn information literacy as a regular feature of each year's curriculum. It is therefore important for curricula to emphasize and assess rigorous, creative, and critical use of source material, starting at an early age, with and through increased collaboration between classroom teachers, librarians, and coordinators of technology for learning.

Another important element of information literacy is digital citizenship, which involves students being aware of the implications of activity on social media (the repercussions of the digital footprint they leave behind, and appropriate and ethical use of the internet) and open-minded about the opportunities information technology offers for problem solving and creative thinking (connected social networks, sharing of ideas, synchronous and asynchronous communication). Across curricula, students can be stimulated to consider issues related to the media at age-appropriate levels. They can then develop a critical view on the role it plays in group perceptions of reality, the global economic market, and social norms. This is vital for critical thinking in the twenty-first century, as the media plays such a large role in

forming public opinion.

We must remember that, even if classrooms and schools have little or no Internet access, they are still preparing students for an interconnected world where social media plays an important role. Therefore, learning experiences can make students aware of these issues whether or not technology is used in school.

### **Implications for educators**

#### ***1. Support the ethical, effective, and efficient use of information.***

Learning experiences at all year levels allow individuals and groups to search for and use information for the creation of original materials, decision-making, and problem-solving. It is important to encourage students to seek information from many different sources, disciplines and cultures. This will contribute to good scholarship, a comparative understanding of different subjects in the curriculum, global awareness, and the best possible work.

***2. Give students opportunities to develop the skills and attitudes necessary in the use of new technologies.*** Information literacy will allow students to increase their use of technology and to develop the skills of analysis, discernment, synthesis, creativity, investigation, collaboration, communication, organization, critical evaluation of sources, and reflection. Schools can enable information literacy by introducing students to recent and new technologies and by demonstrating how to use them intelligently. A key part of this process is educating students in rigorous, creative, and critical use of source material.

***3. Consider ethics, legality, and safety when teaching information literacy.*** It is likely that students will learn about the concept of digital citizenship at each year level. Digital citizenship defines the way a person “participates in society online”. (Mossberger, 2009, p. 173). It is important to ensure that the guiding principles of academic honesty are an important part of information literacy. This also requires standard language and research frameworks for use with teachers, parents, and students. Finally, making available long-term workshops/courses for parents and teachers on subjects such as information literacy and digital citizenship can ensure consistency for students both inside and out of the classroom.

**4. Foster meaningful, independent, inquiry-based learning.**

Incorporating project-based learning as a regular feature of the curriculum at each year level allows students to learn through experiential adaptation to the world. Schools should refer to design and/or inquiry cycles, and should be clear when they refer to them in order to support students' information literacy consistently and coherently.

**5. Ensure carefully planned collaboration among all stakeholders.**

A clearly defined information literacy programme requires a set of criteria showing what would be understood as success when judging the effectiveness of the programme and the roles of all stakeholders involved. This involves appropriate interaction and joint planning and teachings among librarians, technology-for-learning coordinators, teachers, and administrators.

**Suggested Readings:** Gardner, 2007; Halpern, 1999; Hattie, 1999; Herman & Chomsky, 1988; Kolb, 2000; Mossberger, 2009; Ohler, 2011; Silver, 2012; Wiliam, 2011.

**3. CRITICAL THINKING**

*Critical thinking is essential for students to become autonomous, independents and open-minded individuals.*

**Research Findings**

Critical thinking is a popular, sometimes overused, term that in reality describes, quite simply, the principles of "good" or "clear" thinking. "Good thinking" is the ability to judge arguments or points of view with intelligence and to not be influenced by ideology, fundamentalism, indoctrination, prejudice, or unverified beliefs. Critical thinking allows students to think for themselves. This approach can be recognized in the following actions and attitudes, which are by no means exhaustive:

- Examining sweeping generalizations in detail and avoiding over-simplifications;
- Clarifying issues, conclusions, and beliefs;
- Clarifying and analysing the actual meaning of words or phrases;
- Developing criteria for evaluation: clarifying values and standards;

- Evaluating the credibility of sources of information;
- Listening critically to what the speaker is actually saying;
- Thinking precisely about thinking: using critical vocabulary (Paul & Elder, 2006).

Critical thinking is not merely rational thinking; it involves propositional (or declarative) knowledge (“knowing that”), procedural knowledge (“knowing how”) and dispositional knowledge (“knowing to”). This involves a respectful, open-minded approach, “intellectual humility and suspending judgment [...], good faith [and] integrity” (Paul, 1990, p. 56). To stimulate critical thinking in its fullest forms, teachers should be aware of these attitudes and attempt to foster them in students.

The way students ask questions is important in their becoming critical thinkers. Questions, notably open-ended ones that require students to justify and provide evidence for their positions, can be a useful tool to stimulate critical thinking (“Can you go through that step by step?”, “Can you explain why that works?”). Critical thinking is also stimulated when students are encouraged to formulate and develop good questions of their own. Finally, questioning for critical thinking goes further than simply asking questions: it implies rigorous follow-through using, among other appropriate strategies, the Socratic method-based on discussion between individuals asking and answering questions to clarify ideas.

It is the quality of the critical thinking itself that is the learning objective. This quality depends in part on the level of relevant knowledge that will be used to support it. There can be little meaningful critical thinking if it is not related explicitly to an understanding of different types of reason in different bodies of knowledge. Critical thinking should be developed in all domains and considered in a whole range of contexts (mathematics, literature, social life, creative thinking).

Finally, critical thinking, like creative thinking, requires an open-minded approach from the teacher. Students are more likely to develop critical thinking skills when they feel free to take risks, are corrected without feeling criticized, and when they challenge, are challenged, and discuss different opinions. Classrooms that promote wide-ranging discussion

among students so that arguments both in favour of and against ideas can be examined in detail create supportive environments for students to express themselves without fear of judgement.

### **Implications for Educators**

Children can be taught to think critically from a young age, but in an age-appropriate manner. It is recommended that each school have a unique, logical sequence of learning objectives that students can discover related to critical thinking within the curriculum.

**1. Nurture inquisitiveness.** It is important to appreciate and develop the observations young people make of the world and their natural capacity for critical thought when and where possible. Students should be encouraged to reflect critically on different types of knowledge, not only in academic domains but in terms of broader personal and shared experiences. In addition, students can be shown how to appreciate what makes a good question (challenging deeper thought, seeking justification, eliciting abstractions and generalizations from particulars and examples) and how different types of questions can be used to elicit different responses (clarification, probing assumptions, probing reason and evidence, viewpoints or perspectives, probing implications and consequences, questions about questions).

**2. Model sceptical thought.** Teachers can demonstrate healthy scepticism when dealing with unproven information. This does not mean dismissing claims of unconfirmed knowledge on principle, but being prepared to investigate claims thoughtfully and methodically. This is especially important in today's world where the media plays a crucial role in forming public opinion. Young people need to learn how to be sceptical when approaching knowledge that purports to be true.

**3. Encourage international-mindedness.** Since critical thinking involves open-mindedness, good listening skills, and the ability to look at different points of view, it can lead to a rich appreciation of cultural, national and historical diversity in human thought. Therefore, it is important for students to be encouraged to explore and appreciate

diverse scholarly traditions, including major differences and similarities between “Western and non-Western intellectual cultures”. Schools can ensure that the elements of critical thinking are also evident when students are taught about service learning, self- and peer-assessments, and portfolios.

**Suggested Readings:** Paul, 1990; Paul & Elder, 2006; Ryle, 1971; Siegel, 1985; Singh & Qi, 2013; Swan & Pead, 2008.

#### **4. CREATIVITY**

*Students use creativity to rethink situations from new perspectives, to see approaches that are not apparent.*

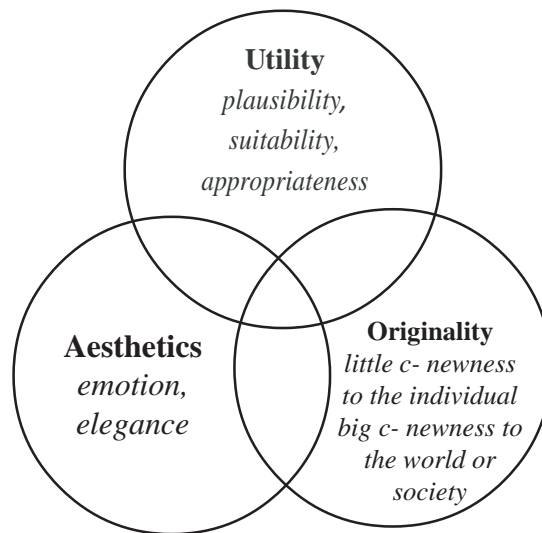
##### **Research Findings**

There are many definitions of creativity, but they have in common these essential elements

The creative thinker will see hidden patterns, reconceptualise the fundamentals of a state of affairs, step back and see the big picture, and entertain ideas that have not been thought of before. The creative process is seen as controlled and automatic, conscious and unconscious. It can be viewed through the following steps:

- Preparation (detecting a problem and gathering data);
- Incubation (stepping away from the problem for a period of time);
- Illumination (a new idea or solution emerges, often unexpectedly);
- Verification (the new idea or solution is examined or tested).

Imagination plays an essential role in developing abstract thought. Play and joy in the flow of creative thinking are essential; teachers should not be afraid to let students play with ideas. However, it is necessary to note that there is a distinction between creative teaching, where there is a focus on planning and teaching procedures, and teaching for creative thinking where the emphasis is on developing the learner’s creative thinking skills. While both are important and the latter may be developed by the former, the teacher’s basic goal is to stimulate creative thinking in the student’s mind.



It is also useful to remember that problem-solving is an important component of creativity and includes the following processes: ask a question; notice; identify a need or opportunity; come up with alternatives; select from options; collect data; test options; verify solutions; apply ideas; and evaluate outcomes. Questions that stimulate responses requiring higher order cognitive functions can encourage creativity, such as the evaluation and/or synthesis of information, application of ideas in new circumstances, or the creation of alternative outcomes. “What if?” and “Why?” questions tend to stimulate creative and critical thinking, especially if followed by questions that probe and encourage the learner to go further.

The creative process should be respected as one that depends on perseverance, rigour, lengthy periods of hard work, and purpose. For creativity to have an impact, the process should be carried through to the end.

Assessment of creativity is challenging and controversial. However, large-scale research has identified some core behaviours that are typical of creative thinking:

- Questioning and challenging;
- Making connections and seeing relationships;
- Envisaging what might be;
- Exploring ideas and keeping options open;
- Reflecting critically on ideas, actions, and outcomes.

These are best evaluated formatively, particularly through self-evaluation, peer-evaluation, and portfolio assessments. Given the characteristics of creative thinking, it is important for assessments to be multi-dimensional.

For more information on critical thinking, please refer to the Educational Practices Series Issue #25, *Nurturing creative thinking*.

### **Implications for Educators**

**1. Encourage creativity in all disciplines.** Creativity is a life skill and approach that does not belong exclusively to the arts. It can be fostered in all disciplines, and across all physical, intellectual, social and emotional areas. Whenever possible, play can be used to extend the range of opportunities to think. This also means having students take time to review their learning from multiple perspectives.

**2. Demonstrate creative thinking.** It is recommended that both teachers and students be encouraged to demonstrate their creative thinking to help others recognize and appreciate what is involved. Teachers can attempt to create a class atmosphere or other spaces within school that are likely to stimulate creativity. It is also helpful for teachers to remain aware of the types of resources and teaching strategies/tasks that demand rigorous creative thinking on the part of the students.

**3. Foster preparatory knowledge and skills.** Deep creative thinking can be fostered only if preparatory knowledge and skills have been developed. It is important for educators to make certain that prior understanding has taken place to ensure that creative thinking is meaningful. Subject knowledge should be at an adequate level so that creativity is a genuine extension of learning and not a superficial event.



**4. Ensure ideas are actualized.** Creativity is not just about thinking, but what you do with your creative thoughts. Teachers can encourage students to carefully select the ideas they decide to pursue further and use analytical skills to judge the value and impact of their proposed actions. This will allow students to play a leading role in their own learning. Students need to plan for a future that is likely to develop at an accelerating rate and where creativity will be as important as sustainability for the survival of the human species.

**Suggested Readings:** Csikszentmihalyi, 1996; Fillis & McAuley, 2000; Fredericks, 1991; Kampylis & Berki, 2014; Kazemi, 1998; Koestler, 1964; Lindström, 2006; Newton, 1996; QCA, 2004; Spencer, Lucas & Claxton, 2012; Sternberg, 1996; Torrance, 1970; Treffinger et al., 2002; Zabelina & Robinson, 2010.

## 5. STEM LEARNING

*The teaching and learning of science, technology, engineering and mathematics benefit from an integrated approach.*

### **Research Findings**

STEM learning is learning in science, technology, engineering and mathematics: it suggests an integrated approach to these domains whereby science and mathematics are learnt through interdisciplinary projects that use technology and the principles of engineering. Many of the world's most pressing problems are so complex that they cannot be solved from one epistemological framework: they require an interdisciplinary approach that draws from different fields. Although interdisciplinary learning should not be restricted to these areas, STEM provides particularly useful opportunities for meaningful, innovative practices that reflect the increasingly integrated nature of real-world scientific research.

Integrated humanities and sciences courses tend to be offered in primary and middle schools, though some argue that they would be better positioned at the latter stages of formal schooling when students

have enough subject-specific knowledge and can think rigorously enough to engage in authentic interdisciplinary work. This work involves complex problem-solving with an emphasis on ethical issues in the sciences (bioethics, scientific rigour in the name of 'good science' despite economic and social pressure, genuine group work and peer review).

Reasoning and problem solving, which lie at the heart of mathematics, have a core role to play in learning science and technology. The twenty-first century approach can benefit from taking problems embedded in real-life scenarios, notably in engineering, and placing them at the centre of the learning of science, mathematics and technology. Furthermore, students participating in STEM learning may work best in groups where they can co-construct knowledge through dialogue, discussion and sharing, provided that these groups are given clear instructions on how to work together.

### **Implications for Educators**

**1. Prioritize an interdisciplinary approach to STEM learning.** It is important to set aside sufficient time for teachers to collaborate on planning, timetabling, professional development and partnerships that would allow STEM learning to be carried out through interdisciplinary projects. These projects can be aimed at learning objectives and should prepare students for formal assessments through the most exciting and concrete methods available and possible. For effective transfer of knowledge across disciplines, learning needs to be based on concepts rather than topics. Where necessary, consider condensing the timetable into a shorter period of time at the appropriate year level so that space can be found for interdisciplinary projects.

**2. Enable innovative, creative and authentic STEM learning.** Students can benefit from the opportunity to work on real-world problems and to communicate with experts outside the school. Schools are encouraged to use expertise found among parents to enhance the understanding of mathematical, technological and scientific real-world dynamics. This also means ensuring that STEM learning projects are inspired by good questions. The study of science and mathematics

should be associated, where appropriate, with technology. In addition, it is important for educators to be careful to maintain a gender balance in STEM learning by actively encouraging girls to participate in these subjects as much as boys.

**3. *Emphasize the essentials of STEM history.*** The socio-economic, historical and cultural background of STEM subjects should be explored by students. It is important for students to have an opportunity to understand science, mathematics and technology as constructs that have developed over time with specific values and assumptions. Analysis of case studies across various domains and in different historical periods could be one approach. Similarly, teachers can encourage students to question the usefulness of their STEM learning and to probe its relevance.

**4. *Display STEM projects both inside and outside of school.*** Interdisciplinary projects allow for taking learning out of the classroom and into the community to connect students with industry and the world of work, where they can benefit from external contact, feedback and real-world situations. Teachers can ensure that STEM projects are displayed around the school, as well as take advantage of opportunities to publicize projects through partnerships with universities and other external organizations.

**5. *Strengthen students' abilities to transfer knowledge and skills to new situations.*** Core STEM skills include magnitude estimation, conjecture, hypothesizing, prediction and generalization before experimentation, and creative problem-setting and -solving. STEM skills can be used to give students confidence to approach the world with curiosity, sound thinking and the ability to approach unknown circumstances with an array of critical-thinking strategies, including a thorough understanding of scientific processes. Teachers may also encourage students to ask critical questions to clarify problems and to make responsible decisions.

**Suggested Readings:** Buchanan, 1992; Mercer, Dawes, Wegerif & Sams, 2004.

## 6. CONCEPT-FOCUSED LEARNING

*Organizing information in conceptual structures is fundamental for learning.*

### **Research Findings**

One of the most important aspects of learning is the way that we organize information so that it can be understood and retrieved. Learning is most effective when it is articulated around concepts rather than topics. Concepts are mental categories that allow us to identify and classify objects, events or ideas, building on the notion that they are similar in significant ways and/or have certain common, relevant features. Studies indicate that concepts-focused learning creates deeper understanding because it is based on cognitive structures.

Learning for understanding takes place when it is categorized in higher-order conceptual structures: this means that the learner identifies the basic characteristics of something that allow it to be generalized to a higher, more abstract level. It is by identifying the basic characteristics of a piece of information that the learner will be able to master an understanding of what defines it and, therefore, what its purpose and meaning are. Research indicates that given the exponential growth of information today, we need to rise to a higher level of abstraction to create schema for organizing and patterning information and to facilitate the transfer of learning through time, across cultures, and across situations.

An essential question for all teachers and students is why they learn what they do. A question like this will force the learner to reflect beyond the immediate surface of the learning experience. If knowledge is not taken to a higher level of abstraction, then it is not possible to recognize and appreciate its significance and basic characteristics. Learners will be faced with disparate elements that are not unified by any obvious principles or laws. However, when the teacher and student look at learning experiences conceptually, their perspectives shift, from disassociated pieces of knowledge to a group of broad categories that share common features.

A conceptual framework is an analytical tool with several variations and contexts. It is used to make conceptual distinctions and organize ideas. Strong conceptual frameworks capture something real and do this in a way that is easy to remember and apply. These organizational structures make learning more efficient, relevant and meaningful. Some examples of the broad concepts that can be used to organize knowledge include: conflict, complexity, beliefs/values, paradox, interdependence, interactions, freedom, transformations, force, identity, patterns, relationships, origins, change, perspective, reform, heroes, power, influence, system, balance, structure/function, innovation, design, genius, aesthetics and creativity.

Finally, conceptual frameworks are necessary for students to be able to transfer knowledge to different contexts; it is through a broad concept that students will transfer lessons learnt in one area to another. One of the essential aims of education is to make clear the elements of knowledge through a structure that will allow for deep understanding, transfer and application. Reflecting on concepts rather than topics allows for an interdisciplinary transfer of learning: we can apply the principles of literary analysis to the appreciation of art, or the tenets of scientific experimentation to the social sciences, and so on.

### **Implications for Educators**

**1. Encourage conceptual understanding.** Conceptual understanding means actively building new knowledge from knowledge previously acquired through experience or instruction. Teachers can encourage conceptual understanding by taking their students through the process of ordering information. This includes going from (1) factual knowledge (separate pieces of information) to (2) topics (groupings of pieces of information); to (3) conceptual structures (ideas within and across topics that identify the common characteristics linking pieces of information to one another); to (4) principle generalizations (laws); and, finally, (5) theory, where broad statements can be made about the body of knowledge in question. It is through this rigorous process that students will be able to master

understanding of individual elements and how they fit into an overall system.

**2. *Enable efficient learning.*** It is recommended that students learn to place the knowledge to which they are exposed into categories of conceptual frameworks that will serve as “lenses”, in order to make learning more efficient. In addition, by encouraging students to bring their intellect to the topic of study through concepts, they are more engaged with the learning process than they would be through a purely factual approach.

**3. *Create collaborative curriculum to ensure progress.*** Equally important, is for teachers to recognize “Threshold” concepts in the curriculum and within a student’s learning progression. “A threshold concept represents a transformed way of understanding, or interpreting, or viewing something without which the learner cannot progress. As a consequence of comprehending a threshold concept there may thus be a transformed internal view of subject matter, subject landscape, or even world view, and the student can move on” (Land et al., 2005, p. 53). Teaching and learning, as well as collaborative curriculum design, can take threshold concepts into account and examine ways of basing instruction around these significant, troublesome areas of knowledge acquisition. Collaborative curriculum also allows for deeper, concepts-focused interdisciplinary learning, which involves investigating a single concept through the disciplinary lens of two or more areas of knowledge for deeper understanding.

**4. *Align concepts with learning objectives and assessments.*** Finally, it is important for educators to create assessments with diagnostic, formative or summative purposes to give students opportunities to show their conceptual understanding of the domain in question. This can be done in numerous ways and has implications for task design. Learning objectives within the curriculum should not communicate specific elements of knowledge and skills development alone, but rather incorporate these facets of learning into broad concepts so that teaching and learning is directed at such understanding.

**Suggested Readings:** Erickson, 2007; Erickson, 2013; Land et al., 2005; Smith & Medin, 1981.

## **7. HEALTH AND MINDFULNESS**

*Encouraging students to be physically, mentally and socially alert enables them to be ready to adopt new solutions for new experiences.*

### **Research Findings**

One of the results of high-stakes assessments in schools is the pressure it places on students and teachers, often leading to too much stress, and, in extreme cases, mental breakdown. Integrating health and mindfulness into education is therefore essential, and goes beyond the classroom to involve the ethos of the entire educational system. The aim is to increase the mental and physical well-being of students in preparation for the long lives they can expect to lead. The education provided should include a range of opportunities to learn, to grow, to succeed and “to develop to their fullest the powers of each individual to understand, to modify and to enjoy his or her environment, both inner and outer, in its physical, social, moral, aesthetic and spiritual aspects” (Peterson, 1987).

Mindfulness can be defined as “the awareness that emerges through paying attention, on purpose, in the present moment, and non-judgmentally to the unfolding of experience moment by moment” (Kabat-Zinn, 2003, p. 145); it is “openness to novelty, alertness to distinction, sensitivity to different contexts, awareness of multiple perspectives, and orientation in the present, paying attention to the immediate situation” (Sternberg, 2000). Educational offerings ideally take students away from mindlessness, which entails an “overreliance on categories and distinctions drawn in the past and in which the individual is context-dependent and, as such, is oblivious to novel (or simply alternative) aspects of the situation” (Langer, 1992, p. 289).

Integrating health and mindfulness goes beyond physical well-being and entails a holistic state whereby thoughts, actions and impressions are interrelated. In a world with an enormous amount of information

noise, hyperactivity, competition, and in many regards, a coarsening of society, a twenty-first century curriculum must allow students opportunities to distil their thoughts. In doing so, students will develop ways to bring their mind and body together in an attitude of oneness in which they can focus their thoughts on the environment, *self and others*.

### **Implications for Educators**

**1. *Encourage mindfulness as a way to maintain health and well-being.*** Members of the school community can work together to create environments that allow learners to reflect meaningfully on their interactions with the outside world and their inner sense of being. In this way students will be able to appreciate what is going on around them and their own sense of purpose. By enhancing intrapersonal, interpersonal and environmental awareness, students will be enabled to take more thoughtful decisions about their lives.

**2. *Empower students to learn more effectively and to think more clearly.*** Students, like staff, can be encouraged to clarify their thoughts and learning strategies through “reflective and metacognitive thinking, self-regulation, decision-making, and problem solving, as well as disciplinary forms of thinking” (Ritchhart & Perkins, 2005, p. 777). This is a broad, ongoing goal that is dependent on the quality of teaching and learning, assessment and curriculum design. A mindful approach will encourage students and teachers to identify items of thought with a sense of presence, so that learning is not an unidentified, automatic process, but rather a recognized pathway that pursues clear objectives and requires a mentally alert state.

**3. *Encourage awareness of self, others and context.*** It is important for the daily life of the school to be based on a holistic approach to teaching and learning. Students should be made aware of the significance of participating in the life of their community and what it means to be part of multiple communities (school, home, local, global). Schools can aim to help all learners to be aware of values and beliefs and to care about them, but also at times to question and challenge them. A simple message to all learners is: “be brave, be aware and be respectful”.



**4. Provide space and time for reflection for individuals to realise, develop and understand their potential.** When given time to examine themselves in their environment, students are able to reflect on their choices. The route to mindfulness is an individual one and the time necessary should be found to create the conditions for this to happen. Physical space may be a consideration so that students are provided with opportunities to find silence, peace and calm to enhance their presence of mind. This can also be done by encouraging teachers to use silence as a medium for mindfulness through set procedures, such as occasional one-minute silences, periods where there is no talking, and moments where there is in-depth reflection on a single thought for an extended period.

**5. Foster intercultural diversity, at all levels of communication.** An internationally-minded school is a place where a multitude of different approaches come together. Members of such a community need to make a serious, conscious and on-going effort to put their own worldviews into perspective and to remain sensitive to other people's needs, beliefs, positions and cultural frameworks. It may also be useful to designate a specific person or group to monitor the place and meaning of health and mindfulness at each level of the school community.

**6. Develop and sustain a Health Promotion Project.** It is recommended that all schools aim to improve the quality of teaching and learning in the school through the broad concept of a healthy school-one that values the growth of social and human capital, and the active promotion of a healthy life for all those living and working in the school. This broad concept of health is defined in the Ottawa Charter for Health Promotion (WHO, 1986) as building healthy public policy, creating supportive environments, strengthening community actions, developing personal skills and reorienting health services. Steps can be taken to ensure that the promotion of health happens at all levels of the school community (structural organization, teaching and learning, academic programmes, teamwork, and partnerships with the local community). Finally, schools may consider professional development in health and mindfulness through programmes, pedagogical days and workshops.

**Suggested Readings:** ISG, 2012; Kabat-Zinn, 2003; Langer, 1992; Peterson, 1987; Ritchhart & Perkins, 2005; Sternberg, 2000; WHO, 1946; WHO, 1986.

## **8. SERVICE LEARNING**

*Participating in service learning enables students' personal growth and allows them to contribute to society.*

### **Research Findings**

Service learning is education taking place through voluntary work and community projects. It highlights the rights and responsibilities needed to live together in a better world. This is a vital part of experiential learning in that concept-formation follows from concrete experience.

In the twenty-first century, it is vital that schools recognize the place that service learning has to play in the sustainability and regeneration of society. It is a way to develop notions of reciprocity, meaningful action and purposeful engagement between the individual and the local community so as to make the world a better place. Service learning is at the heart of what it means to be human. The fundamental goal of service learning is to empower students to take an active part in an education that develops a profound sense of humanity. This implies values such as humility, empathy and open-mindedness, and personal conduct such as commitment and initiative that are mediated by critical, creative, alert and reflective thinking.

Service learning is also a cornerstone of citizenship education in that it explores “the duties and rights of citizens at local, national and global levels” and “the nature of personal and civic identity” (ISG, 2009). Schools have a crucial role to play as community leaders through the cultural activities they organise, the partnerships they establish with local authorities and the way they work with their parent bodies to make an impact around them.

Studies indicate that service learning leads to the development of the whole child: it takes him or her beyond academic learning into applied knowledge and personal conduct. This enrichment of the educational

experience can lead to wisdom. Wisdom is not just about maximizing one's own or someone else's self-interest, but about balancing various self-interests (intrapersonal) with the interests of others (interpersonal) and of other aspects of the context in which one lives (extrapersonal), such as one's city, country or environment.

### **Implications for Educators**

It is recommended that service learning be recognized as an essential part of education. It is important for students to become directly involved in service projects so as to internalize the values of the school and carry them out in real-life situations.

- 1. *Ensure service learning meets a genuine need.*** Before engaging in voluntary work, students can be encouraged to find out about the needs for voluntary work at different levels within the community. It is through research, communication with the person or group served and direct experience that students will learn what it means to participate in a community. Developing an understanding of the community and its different needs will make subsequent service work more valuable.
- 2. *Plan critically and respectfully.*** Actions and interactions in the context of voluntary service activity have consequences of which students need to be aware. It is important for service activities to be planned critically and respectfully, in conjunction with the person or group served. Showing empathy and respect for the person or group served is also imperative. It is important to avoid patronizing or "messianic" approaches in service. When students see themselves as learners first, they are better able to understand that people from different cultural and socio-economic backgrounds will also have something to teach them.
- 3. *Make long-term commitments.*** Whenever possible, projects developed by and/or with students need to take place over a lengthy period of time. Even though students may be involved in short-term support during emergencies, such as natural disasters or accidents, it is preferable that they plan their service projects with long-term

involvement and impact in mind. Commitment to a project is more likely to develop if students have carried out careful planning, SWOT (Strengths, Weaknesses, Opportunities, and Threats) analyses and face-to-face discussions with the person or group served.

**4. Enable personal growth.** Students have different levels of understanding and involvement in service. It is important for this to be taken into account when proposing a service-learning programme. Giving students constructive and precise feedback during and after these activities is an essential way of developing the quality of service learning.

**5. Follow a cycle of inquiry.** While there are different inquiry models that can be used to contribute to students' service learning, the key steps in these models follow a sequence of investigation, preparation and planning, action, reflection and demonstration. Reflection can take many forms (text, art, diverse media and materials). Authentic, meaningful and critical reflection will allow students to better plan and investigate future service learning experiences. Students can be encouraged to clarify their expectations and to develop their reflective skills.

**6. Celebrate service learning.** It is important for schools to send the message to the whole school community that service learning is a key part of students' education. Students' achievements in this domain may be recognized or staff involvement acknowledged. Service learning can also provide opportunities to bring all members of the school community together and can be used to explore partnerships with parents and alumni.

**Suggested Readings:** Berger Kaye, 2010; ISG, 2009; Kolb, Rubin & McIntyre, 1974; Short et al., 1996; Sternberg, 2009.

## **9. LEARNING SUPPORT**

*Teaching students how learning happens and how they themselves can become better learners is imperative for student progress*

### **Research Findings**

An area that is particularly interesting to investigate is learning

support (also called special educational needs), mainly because the strategies that have been developed in this area of education, such as accommodations (adjusting teaching practice to meet learner's needs) or modifications (adapting the content of what is being taught) apply to the needs of all students in a modern educational paradigm. We see such strategies as necessary elements of differentiated instruction for all learners, especially with the advent of new technologies that allow for adapted online learning environments.

Learning support remediation involves metacognition (learning about learning), scaffolding, mastery learning, high levels of feedback and multiple strategies for learning. In many ways, this type of pedagogy is a distillation of the quality and excellence that is prevalent in any high-performing classroom. In this regard, teachers consider themselves specialists in cognitive psychology rather than merely subject specialists. It is important for the psychology of learning to be promoted if we are to rise to the challenge of providing students with an education in which they can succeed.

A typical process in learning support is the development of an individual education plan (IEP) focused on the specific learning goals of the student. This highly individualised approach to learning should not be reserved just for those experiencing difficulties, but could form the basis of general teaching and learning.

A differentiated instructional programme is one where every learner's needs are met. Recent neurobiological progress has directed educational philosophy to the idea that each individual learns differently and that differentiated instruction is vital if what we want to achieve is not just getting the curriculum covered but seeing students truly master their learning. Therefore, differentiation should not be considered a strategy to be used only in exceptional circumstances; that implies that the norm is a one-size-fits-all approach, in which little attention is paid to the student's specific needs.

### **Implications for Educators**

*1. Respect learning styles and capabilities of all students.* By

valuing diversity, educators are responsible for differentiating their instruction to correspond to the needs of their students. To respect the diverse needs of students, schools can constantly seek to better understand the way students learn and to provide them with suitable support and innovative approaches. Teachers are also encouraged to create safe, respectful and challenging learning environments for students to achieve their individual potential both inside and outside the classroom. It may also be necessary for schools to devise procedures for removing students from particular lessons or introducing them into other lessons, with careful attention paid to the role of teaching assistants, in order to provide them with the support they need based on their learning style. This strategy should be coupled with a constant reassessment to determine re-integration of withdrawn students into the mainstream.

**2. *Provide strategies to encourage confidence.*** By encouraging students to be independent learners who understand their strengths and weaknesses and who can self-regulate, schools aim to educate and prepare them to be adaptable, and to function in the world around them. Teachers can achieve this by being aware of and promoting strategies that support self-regulated learning, such as goal setting, planning, attention control, self-monitoring, help-seeking and self-evaluation.

**3. *Reward progress and provide feedback.*** To support student progress, teachers can reward effort and provide feedback as necessary to students. This includes designing realistic, attainable, individualized objectives for students, identifying barriers to learning and showing students how to overcome them. Celebrating outstanding student achievement in different areas of learning allows for recognition of diverse skillsets. Assessment can be used to drive teaching and learning, encouraging students to view learning as something that can incrementally evolve and improve, rather than as a process that is out of their control.

**4. *Collaborate with parents, students and colleagues.*** Finally, collaboration is important in providing effective support for students.

Working in interdisciplinary teams, teachers can create a collaborative environment that allows for an exchange of expertise and ideas among all professionals. It is recommended that schools attempt to cultivate strong, trusting partnerships with parents, students, teachers, administrators and educational specialists. This can be done by holding frequent student support group meetings and preparing Individual Education Plans (IEPs) where appropriate. Ensuring ongoing, effective professional development opportunities may also stimulate learning support and new approaches for all teachers.

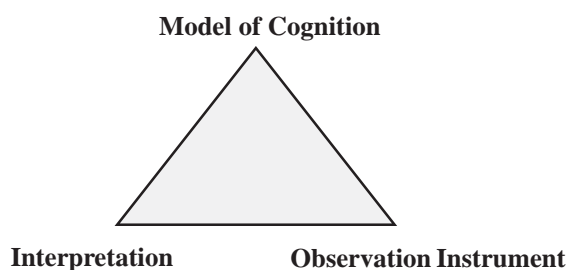
**Suggested Readings:** Dweck, 1999; Zumbrunn, Tadlock & Roberts, 2011.

## 10. ASSESSMENT

*Assessment, through a range of techniques, is important to evaluate progress and follow students on their learning progression*

### Research Findings

Educational assessment involves three interconnected parts: a model of cognition, an observation instrument and a model for interpreting student performances. These elements can be represented as a triangle. For assessment to be of high-quality there should be symmetry among the three vertices of the triangle.



(Developed from Pellegrino, Chudowski & Glaser, 2001)

**Cognition** refers to thinking and learning. Assessment begins with a clear understanding of the cognition that is desired. This model of

cognition can include knowledge types (propositional/ declarative, procedural, dispositional, applied); skills (discursive writing, arithmetical calculation) and competences (critical thinking, creativity, collaboration); attitudes (perseverance, open-mindedness); and metacognition (thinking about thinking and learning about learning).

**An observation instrument** refers to the instrument that is developed to stimulate a student response and to record that response. An observation instrument allows students to represent their knowledge, skills and competences, attitudes and/or metacognition through conversations, responses to questions, or performances on various tasks. To ensure that assessment is fit for its purpose, teachers need to choose an observation instrument that is appropriate for the corresponding model of cognition. A key measure of the quality of an observation instrument is its validity. There are numerous types of validity, but the most essential ones to consider include:

- Face validity – whether the observation instrument really captures or tests the learning that it is supposed to
- Ecological validity – whether an observation instrument is appropriate to the context

**Interpretation** refers to what can be assumed about what a student knows and can do based on responses to the observation instrument. In order to interpret student performance, the evaluator needs assessment criteria or “rubrics”. A key concept to consider when interpreting student performances is reliability: in other words, how sure can we be that the conclusions we reach about student performances on observation instruments are accurate, fair and stable. There are many types of reliability, but some of the main ones to consider are rater reliability (how consistent the scorer is) and grade-cut reliability (how accurate and fair the ways of categorizing student responses are).

Clarifying the purpose of an assessment before it is designed is essential. Purposes include:

- *Diagnostic*, meaning that the purpose of the assessment is to establish what a student already knows and can do, usually at the beginning of a unit or course of study



- *Formative*, meaning that the purpose of the assessment is to help students in their learning (assessment *for* learning)
- *Summative*, meaning that the purpose of the assessment is to evaluate how much a student knows or can do once they have completed a learning experience, which usually happens at the end of a unit or course (assessment *of* learning)

The purpose of an assessment will influence task design, assessment criteria and interpretation. While assessments can have more than one purpose, in general the larger the number of purposes for a single assessment, the lower the quality and precision of the alignment of the assessment triangle vertices.

### **Implications for Educators**

**1. Use a variety of sources of evidence.** Sources of evidence, including peer- and self-assessment, help students with different learning styles realize learning outcomes. Teachers can also conduct peer evaluations outside the formal evaluation process to keep open discussions about the principles of assessment.

**2. Have a clear understanding of the purpose, expectations and learning objectives.** Assessment needs to be based on agreed criteria that are communicated to students before they engage in a task. Where collaborative skills are being assessed, it is important to give students clear guidelines on how best to work in groups, so that all students are engaged and every contribution is treated with respect. Feedback should correspond clearly with assessment goals and criteria. It is also important for assessment to take into account the language ability of individual students.

**3. Emphasize assessment for the purposes of learning.** This involves detailed, process- and task-specific feedback, allowing learners to understand how they are doing, where they are going and what they need to do next, in order to keep learning moving forward. Feedback should be timely, specific, and focused on learning progression. Student responses to assessment feedback then form the basis for subsequent learning.

**4. Allow students to generalize their knowledge, skilfulness and/or competency.** The end of a learning cycle (unit, topic, term, year) can contain assessments with a summative purpose that involve the basic principles of quality test design. It is important that assessment be designed to maximize the reliability of interpretations made about student performance. To ensure this, teachers can observe each other's grading frequently and agree on what particular levels of achievement look like at particular ages and domain-specific levels.

**5. Ensure authenticity and relevance of assessments.** Assessments derived from authentic materials (analogies, models, concrete examples, applications) allow students to come into contact with real-life situations. This encourages learners to connect their learning with a real-world context that is relevant to them.

**6. Enable fair and equitable conditions.** Allow students from a variety of backgrounds to show what they can do and what they know. Well-designed assessment tasks will attempt to minimize external, material or culturally-specific influences that can affect student performance because they are suitable to some learners but not all of them. Carrying out diagnostic assessments at the beginning of work can also make sure that students' prior knowledge and misconceptions are identified and discussed before the teaching and learning of a new unit begins. It is important to design assignments regardless of the availability of equipment, home-learning environments and parent dispositions; rather, focus on minimal resources and student-centred factors that have been established and monitored appropriately in the classroom.

**7. Encourage students to take responsibility for their own learning.** Portfolio assessments allow students to show pieces of work that correspond to the learning process, the areas where they are strong, and what they know or can do outside of the school's learning parameters. Encouraging students to reflect on learning also allows them to take ownership of the process by giving them ample opportunity to look over the work they are doing and have done, understand the processes

that are or were involved, and think about the strategies they used to reach their new level of learning.

**8. Achieve a strong alignment of the three vertices of the assessment triangle.** This can be done by ensuring that the model of cognition is reflected in an observation instrument that is valid and fit for its purpose. Interpretations made about student performances on the observation instrument can then be aligned with the limitations and nature of the instrument in question, as well as the intended learning outcomes. Finally, it is recommended that curriculum leaders provide clear school-level guidelines on feedback, reporting and grading to the teaching community.

**Suggested Readings:** Black, 2013; Hattie & Timperly, 2007; Mercer et al., 2004; Pellegrino, Chudowski & Glaser, 2001.

## CONCLUSIONS

These principles bring together core elements for learning in the twenty-first century. They encompass a notion of learning that involves knowledge, competences, values and attitudes, rather than just narrow, technical skills. Furthermore, the principles incorporate school processes and the involvement of the learning community. They require deep reflection and action to make education more meaningful. As such, this is a holistic account of learning, a vision that spans some of the essential questions that we must ask ourselves if we want students to be empowered for lifelong learning in today's complex world.]

The development of these principles was made possible through collaboration among teachers, students, parents, school leadership, academics and researchers. Its implementation and success will depend on similar commitment to genuine collaboration.

## REFERENCES *(Reference styles as provided in original publication are not of JAIAER)*

Acedo, C. & Hughes, C. (2014). Principles for learning and competences in the 21<sup>st</sup>-century curriculum. *Prospects*, 40(1), 503-525.

- Berger Kaye, K. (2010). *The complete guide to service learning*. Minneapolis, MN: Free Spirit Publishing.
- Bertram Gallant, T. (2011). *Creating the ethical academy: A systems approach to understanding misconduct and empowering change in higher education*. New York: Routledge.
- Black, P. (2013). Formative and summative aspects of assessment: Theoretical and research foundations in the context of pedagogy. In McMillan, J.H. (Ed.), *Sage handbook of research on classroom assessment*, p. 167178. Los Angeles, CA: Sage.
- Buchanan, R. (1992). Wicked problems in design thinking. *Design Issues*, 8(2), 5–21.
- Coffield, F., et al. (2004). *Learning styles and pedagogy in post-16 learning: A systematic and critical review*. Trowbridge, UK: Cromwell Press Ltd.
- Csikszentmihalyi, M. (1996). *Creativity: Flow and the psychology of discovery and invention*. New York, NY: HarperCollins.
- Dweck, C.S. (1999) *Self Theories: Their Role in Motivation, Personality, and Development*. Hove: Psychology Press, Taylor and Francis Group.
- Erickson, L. (2007). *Concept-based curriculum & instruction for the thinking classroom*. Thousand Oaks, CA: Corwin Press Pub.
- Erickson, L. (2013). *Concept-based curriculum and instruction: Engaging the child's mind*. [Presentation at the ninth Annual Education Conference at the International School of Geneva, 2014.]
- Fadel. (2011). Redesigning the curriculum. <[curriculumredesign.org/wp-content/uploads/CCR-Foundational-Whitepaper-Charles-Fadel2.pdf](http://curriculumredesign.org/wp-content/uploads/CCR-Foundational-Whitepaper-Charles-Fadel2.pdf)>
- Fillis, I. & McAuley, A. (2000). Modelling and measuring creativity at the interface. *Journal of Marketing Theory and Practice*, 8(2), 817.
- Fredericks, A.D. (1991). Using “What if...?” questions across the curriculum, *Learning*, 19, 5053.
- Gardner, H. (2007). *Five minds for the future*. Boston: Harvard Business School Press.
- Halpern, D. F. (1999). Teaching for critical thinking: Helping college students develop the skills and dispositions of a critical thinker. *Journal Directions for Teaching and Learning*, 80, 69–74.
- Hattie, J. (1999). Influences on student learning. Inaugural lecture. University of Auckland, August 2, 1999. <https://cdn.auckland.ac.nz/assets/education/hattie/docs/influences-on-student-learning.pdf>

- Hattie, J. & Timperly, H. (2007). The power of feedback. *Review of Educational Research*, 77(1): 81–112.
- Herman, E. S., & Chomsky, N. (1988). *Manufacturing consent*. New York: Pantheon.
- IAEB International Education Advisory Board. (2013). *Learning in the 21st century: Teaching today's students on their terms*. <[www.cer.tiptort.com/Portal/Common/DocumentLibrary/IEAB\\_Whitepaper040808.pdf](http://www.cer.tiptort.com/Portal/Common/DocumentLibrary/IEAB_Whitepaper040808.pdf)>
- ISG International School of Geneva. (2009). *Foundation Policy on the promotion of the values of the International School of Geneva and for the citizenship education of students*. [www.ecolint.ch/sites/default/files/document\\_files/Promotion\\_of\\_Values\\_2009\\_E.pdf](http://www.ecolint.ch/sites/default/files/document_files/Promotion_of_Values_2009_E.pdf)
- ISG International School of Geneva. (2012). *Focus for the future*, Geneva, Switzerland: Ecolint.
- Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice*, 10, 144–156. [doi:10.1093/clipsy/bpg016.]
- Kampylis, P. & Berki, E. (2014). Nurturing creative thinking. *Educational Practice Series* (25).
- Kazemi, E. (1998). Discourse that promotes conceptual understanding. *Teaching Children Mathematics*, 4, 410–414.
- Koestler, A. (1964). *The act of creation*. New York: Penguin Books.
- Kolb, D.A., Rubin, I.M., & McIntyre, J.M. (1974). *Organizational psychology: A book of readings* (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall.
- Kolb, D. A. (2000). *Facilitator's guide to learning*. Boston: Hay/McBer.
- Land, R. et al. (2005). Threshold concepts and troublesome knowledge (3)\*: Implications for course design and evaluation. In C. Rust (Ed.), *Improving student learning diversity and inclusivity*. Oxford, UK: Oxford Centre for Staff and Learning Development.
- Langer, E.J. (1992). Matters of mind: Mindfulness/mindlessness in perspective. *Consciousness and Cognition*, 1, 289–305.
- Lindström, L. (2006). Creativity: What is it? Can you assess it? Can it be taught? *International Journal of Art and Design Education*, 25(1), 53–66.
- Mercer, N., et al. (2004). Reasoning as a scientist: Ways of helping children to use language to learn science. *British Educational Research Journal*, 30(3), 359–377.

- Mossberger, K. (2009). Towards digital citizenship: addressing inequality in the digital age. In A. Chadwick & P.N. Howard (Eds.), *Routledge handbook of internet politics*. New York, NY: Routledge.
- Newton, D.P. (1996). Causal situations in science: A model for supporting understanding, *Learning and Instruction*, 6(3), 201–217.
- Ohler, J. (2011). Digital citizenship means character education for the Digital Age. Kappa Delta Pi, Centennial issue. <<http://www.jasonohler.com/publications/articles.cfm>>
- Paul, R. (1990). *Critical thinking: What every person needs to survive in a rapidly changing world*. Santa Rosa, CA: Foundation for Critical Thinking.
- Paul, R., & Elder, L. (2006). *A guide for educators to critical thinking competency standards*. Dillon Beach, CA: Foundation for Critical Thinking.
- Pellegrino, J.W., Chudowsky, N., & Glaser, R. (2001). *Knowing what students know: The science and design of educational assessment*. Washington, DC: National Academy Press.
- Peterson, A.D.C. (1987). *Schools across frontiers: The story of the International Baccalaureate and the United World Colleges*. Chicago, IL: Open Court.
- QCA – Qualifications and Curriculum Authority. (2004). *Creativity: Find it, promote it*. Sudbury, UK: QCA Publications.
- Ritchhart, R. & Perkins, D. (2005). Learning to Think: The Challenges of Teaching Thinking. In K.J. Holyoak and R.G. Morrison (Eds.) *The Cambridge Handbook of Thinking and Reasoning*. New York: Cambridge University Press.
- Ryle, G. (1971). Knowing how and knowing that. In G. Ryle (Ed.) *Collected papers* (Vol. 2, pp. 212–25). New York: Barnes & Noble.
- Schleicher, A. (2011). Pearson to develop frameworks for OECD's PISA student assessment for 2015. <[uk.pearson.com/home/news/2011/september/pearson-to-develop-frameworks-for-oecd-pisa-student-assessment-for-2015.html](http://uk.pearson.com/home/news/2011/september/pearson-to-develop-frameworks-for-oecd-pisa-student-assessment-for-2015.html)>
- Short, K.G., et al. (1996). *Learning together through inquiry: From Columbus to integrated curriculum*. Portland, ME: Stenhouse.
- Siegel, H. (1985). Educating reason: Critical thinking, informal logic, and the philosophy of education. Part Two: Philosophical questions underlying education for critical thinking. *Informal Logic*, 7, 2–3.
- Silver, N. (2012). *The signal and the noise: Why so many predictions fail—But some don't*. New York: Penguin.

- Singh M. & Qi J. (2013). *21st century international mindedness: An exploratory study of its conceptualisation and assessment*. Sydney, Australia: Centre for Educational Research School of Education, University of Western Sydney. <[ibo.org/research/programmedevelopment/programmedevstudies/literature/documents/SinghQiIBreport27JulyFINALVERSION.pdf](http://ibo.org/research/programmedevelopment/programmedevstudies/literature/documents/SinghQiIBreport27JulyFINALVERSION.pdf)>
- Smith, E. & Medin, D. (1981). *Categories and Concepts*. Cambridge and London: Harvard University Press.
- Spencer, E., Lucas, B., & Claxton, G. (2012). *Progression in creativity: Developing new forms of assessment: A literature review*. Newcastle, UK: CCE.
- Sternberg, R. (1996). *Successful intelligence: How practical and creative intelligence determine success in life*. New York, NY: Simon & Schuster.
- Sternberg, R.J. (2000). Images of mindfulness. *Journal of Social Issues*, 56(1), 11–26.
- Sternberg, R.J. (2009). *Academic intelligence is not enough. WICS; an expanded model for effective practice in school and later in life*. Worcester, MA: Mosakowski Institute for Public Enterprise. <[www.clarku.edu/aboutclark/pdfs/Sternberg\\_wics.pdf](http://www.clarku.edu/aboutclark/pdfs/Sternberg_wics.pdf)>
- Swan, M. & Peard, D. (2008). *Bowland Maths Key Stage 3: Professional development resources*. Blackburn, UK: Bowland Charitable Trust. <[www.bowlandmaths.org.uk](http://www.bowlandmaths.org.uk)>
- Torrance, E. (1970). *Encouraging creativity in the classroom*. Dubuque, IA: William C. Brown.
- Treffinger, D., et al. (2002). *Assessing creativity: A guide for educators*. Storrs, CT: The National Research Center on the Gifted and Talented.
- UNESCO–United Nations, Educational, Scientific and Cultural Organization. (2013). *UNESCO principles on education for development beyond 2015*. [Adapted from UNESCO Education Sector contribution to the Quadrennial Programme Priorities for 2014–2017 (37 C/5) – unpublished.]
- WHO – World Health Organization. (1946). *WHO definition of health*. <[www.who.int/about/definition/en/print.html](http://www.who.int/about/definition/en/print.html)>
- WHO – World Health Organization. (1986). *The Ottawa Charter for Health Promotion*. <[www.who.int/healthpromotion/conferences/previous/ottawa/en/index4.html](http://www.who.int/healthpromotion/conferences/previous/ottawa/en/index4.html)>
- William, D. (2011). *Embedded formative assessment*. Bloomington, IN: Solution Tree.
- Zabelina, D. & Robinson, M. (2010). Creativity as flexible cognitive control. *Psychology of Aesthetics: Creativity, and the Arts*. 4(3), 136–143.
- Zumbrunn, S., Tadlock, J. & Roberts, E.D. (2011) *Encouraging Self-Regulated Learning in the Classroom: A Review of the Literature*. Metropolitan Educational

Research Consortium (MERC). Virginia Commonwealth University.

**Acknowledgement**

Guiding Principles for Learning in the Twenty First Century by Conrad Hughes and Clementina Acedo (Educational Practice Series 28 of the International Bureau of Education, Geneva, Switzerland) was produced in 2014 by the International Academy of Education (IAE), Palais des Académies, 1, rue Ducale, 1000 Brussels, Belgium, and the International Bureau of Education (IBE), P.O. Box 199, 1211 Geneva 20, Switzerland. The publication states that “It is available free of charge and may be freely reproduced and translated into other languages. Please send a copy of any publication that reproduces this text in whole or in part to the IAE and the IBE”



*Journal of All India Association  
for Educational Research  
Vol.28, No. 2, December 2016, 79-105*

### **TASK, TEACHING AND LEARNING: IMPROVING THE QUALITY OF EDUCATION FOR ECONOMICALLY DISADVANTAGED STUDENTS**

Lorin Anderson, Carolina Distinguished Professor Emeritus, University of South Carolina.

Ana Pešikan, Professor and Head of the Psychology Department, University of Belgrade, Serbia.

#### **INTRODUCTION**

Students of all ages spend a good amount of their time in classrooms engaged in some type of academic work (e.g. worksheets, workbooks, scientific projects, essays, research papers). On average, students from elementary through high school spend approximately one-half of their classroom time working by themselves (“seatwork”) or in groups (“group work”). This time estimate does not include work to be completed at home (“homework”). For college and university classrooms, this figure drops to one-third, with most in-class work done in groups.

Because most of this work is assigned by teachers, each piece of work is often referred to as an assignment. We prefer the term task because the concept of task gives purpose to the assigned work. That is, TASK = ASSIGNED WORK + PURPOSE. For students, tasks provide the answer to the often heard question, “Why am I doing this assignment?” Suppose, for example, students are given a diagram of the human muscular system and instructed to label each muscle. What is the purpose of this assignment? Is it to pass some external examination? Is it to prepare for an internship in an orthopedist’s office? Or is it for some other purpose? Although there is only one assignment, there are multiple purposes (and hence, multiple tasks).

In addition to differences in purpose, tasks differ in their settings, subject matters, scopes, forms, and complexity. Setting refers to both the physical setting (e.g., classrooms, hallways, laboratories, homes, community centers, open fields) and the social setting (e.g., individuals, small groups, competitive, cooperative). The subject matter is the content or academic discipline in which the task is embedded (e.g., language arts, science, visual arts, trades and industries, multi-disciplinary). The scope refers to the length of time needed to complete it (e.g., thirty minutes, three weeks, one semester). Form is the way it is presented to students as well as the way in which students are to respond (e.g., a worksheet with ten pairs of words and pictures to be matched, an essay to be written comparing two different forms of government). Finally, complexity refers to how complicated the task is to understand and/or to complete. For example, procedural tasks (that is, tasks that can be completed by following a prescribed sequence of steps) are less complex than creative tasks (that is, tasks that require the person completing them to invent a way of performing or completing the task).

Every task can be analyzed in terms of these six dimensions: purpose, setting, subject matter, scope, form, and complexity. Suppose, for example, a problem set is given to students for the purpose of seeing whether they can apply scientific knowledge to solve six practical problems. Each problem in the set can be considered a separate task. Students are expected to complete the six tasks working in groups of three seated around a table (setting). Each of the six tasks requires the application of scientific knowledge (subject matter) and is presented in an open-ended form. Because they are unfamiliar problems with no ready-made solutions, the complexity is reasonably high. Finally, students are told that they will have 45 minutes to complete the assignment (scope).

Because tasks are so prevalent at all school levels, they are often forgotten as a focus area in attempts to list the characteristics of effective teachers or “best teaching practices”. In rather comprehensive lists prepared by researchers and educational practitioners, one rarely

encounters the terms “work,” “assignment,” or “task.” The purpose of this booklet, then, is to describe the central role that tasks play (or, perhaps more accurately, should play) in school learning, particularly in efforts to improve the quality of education for economically disadvantaged children and youth. In this booklet we offer a set of eight principles that, when properly applied, should enable teachers to (1) understand more fully the tasks they are using, (2) increase awareness of the reasons for using the tasks, and (3) design, select, and use tasks more effectively with economically disadvantaged children and youth.

**Suggested Readings:** Doyle & Carter, 1984; Hunt, 2009; MacGregor, 2007; National Survey of Student Engagement, 2013; Shernoff, Csikszentmihalyi, Schneider & Shernoff, 2003.

## **1. ENGAGE WITH AUTHENTIC, RELEVANT, AND MEANINGFUL CONTENT**

*When tasks are authentic, relevant, and meaningful, economically disadvantaged students are more likely to value what they are learning and make important connections between what they are learning, what they have learned, and how their learning is related to their lives outside school.*

### **Research Findings**

For a wide variety of reasons, economically disadvantaged children tend to be placed in classrooms (and sometimes entire schools) with other economically disadvantaged children. This placement has implications for the curricular demands placed on these students as well as the type and pace of instruction they receive. The curriculum tends to focus on rote memorization and algorithmic skills with few opportunities to think and reason. Teachers tend to rely on recitation and worksheets to deliver instruction (and, some would say, control students' behavior) and move along at a much slower pace. The prevalence of the *status quo* has led some researchers to question

whether it is possible to provide high-quality instruction to low-status groups. We believe it is possible when tasks are chosen based on their authenticity, relevance, and meaningfulness. Before moving on, we need to make sure that the meaning of each of these three criteria is clearly understood.

Authentic tasks have value beyond the classroom – they connect what students are learning in school to the “outside world.” In contrast, tasks are relevant to the extent that they are consistent with students’ needs and/or interests. It is important to point out that a task may be authentic, but not relevant. This distinction is particularly important for economically disadvantaged students. Finally, tasks are meaningful to the extent that they enable students to make sense of their experiences. “Making sense” means that students are able to build connections between what they are learning and what they have previously learned. Because economically disadvantaged students often have limitations or gaps in their prior learning, it is often more difficult for them to “make sense” of what they are being taught.

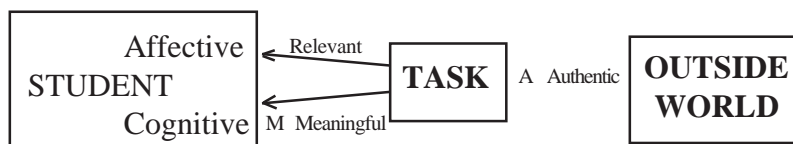


Figure 2-1. The relationship of tasks with authenticity, relevance, and meaningfulness

Authenticity and relevance have consistently been associated with students’ motivation (that is, a willingness to expend the effort needed to learn) and engagement in learning. Meaningfulness enables students to transfer their learning to new situations, rather than simply retain (and regurgitate) what they have been taught. When a task meets all three criteria, it increases the likelihood that students will (1) complete the task and (2) connect task completion with important learning outcomes.

### **Implications for Educators**

1. Take time to get to know your students and, equally importantly, the homes and communities in which they live. Although most teachers are quite knowledgeable of the subject matters they teach, they are often less knowledgeable of their students' lives outside of school. This lack of knowledge is particularly acute when teachers and the students they teach come from very different cultural backgrounds. To acquire or improve their knowledge in this area, teachers can visit children's homes, take supervised walking tours of neighborhoods, and participate in "town hall" meetings attended by parents, family members, and community leaders.

2. When selecting or designing tasks, try to find a balance between authenticity and relevance. Authenticity comes from knowing how what is being taught is applicable in the "real world". With young children, for example, environmental print is all around them. Therefore, tasks that use street signs, billboards, food labels, and greeting cards to teach early reading skills such as word recognition and phonemic awareness are quite authentic. To ensure that these authentic tasks are relevant, teachers should take steps to ensure that the environmental print examples can be seen within the neighborhood.

3. Make every attempt to make tasks meaningful. As mentioned earlier, meaning requires that students make connections between what you are teaching and what your students already know. Notice that it is the students who must make the connection. When teachers attempt to make connections for students, they begin with what they are teaching. When working with economically-disadvantaged children, however, it is much better to begin with whom you are teaching. Rather than giving students examples because they "fit" the topic being taught, begin by soliciting examples from the students and then "fitting" them to the topic as appropriate.

**Suggested Readings:** Harris & Marx, 2009; Mayer, 2001; Roberson, 2013.

## 2. USE LEARNING TASKS AS A PRIMARY BUILDING BLOCK OF THE CURRICULUM

*When teaching economically disadvantaged students, learning tasks should take precedence over teacher-directed instruction; furthermore, assessment tasks should always precede practice tasks.*

### Research Findings

There are three primary purposes for assigning tasks to students. A learning task is intended to facilitate initial learning – to move students from ignorance toward knowledge or from ineptness toward proficiency. An assessment task is intended to determine whether or how well students learned what they were expected to learn. What knowledge did they acquire? What is their level of proficiency? Finally, a practice task is intended to facilitate retention (e.g., of concepts or facts), fluency (e.g., of reading or mathematical computations), or automaticity (e.g., of keyboarding or playing a musical instrument).

For low-achieving or “struggling” students, a group that quite often includes numerous economically disadvantaged students, the teaching they receive follows a fairly predictable sequence. Teachers talk to or with their students, after which students work alone or in groups on an assignment given by the teacher. This “talk-work” sequence can occur once during a class period or be repeated several times. The assumption underlying this sequence is that students learn by listening to and/or watching the teacher, not by engaging in a task alone or with others. Therefore, it is only after students have been taught that tasks are assigned to them. The purpose of the tasks, then, is either to assess whether students learned what they were taught or to give students opportunities to practice what they were taught.

Although the “talk-work” sequence is observed quite frequently in countries throughout the world, it is not found in all classrooms or in all countries. In Japanese mathematics classrooms, for example, teachers begin the lesson by presenting a learning task to their students. As a class, students discuss the task, attempting to solve the problem or answer the question embedded within it. The teacher assumes the role of guide

and/or resource. In situations like this, either “work” precedes “talk” (that is, the sequence is “work-talk”) or “work and talk” occur simultaneously rather than sequentially.

### **Implications for Educators**

1. When teaching economically disadvantaged students, use learning tasks as a primary building block of the curriculum. Over the past quarter century it has become common knowledge that learning requires that students remain actively engaged in the learning process over a substantial period of time. To use a phrase common in the 1970s and early 1980s, students must spend a reasonable amount of “time-on-task” if they are to learn. A curriculum built around learning tasks has the potential to transform economically disadvantaged students from passive recipients of knowledge to active participants and learners.
2. Contrary to the old adage that practice makes perfect, practice makes permanent. Whatever is learned, whether correct or incorrect, remains with students when practiced. As a consequence, practice tasks should be assigned only after there is some evidence that students have learned what they will be practicing. The primary source of this evidence should be assessment tasks, not assumptions made by the teacher based on informal observations and impressions. The “assessment-practice” sequence is particularly important for economically disadvantaged students who are more likely to return to homes in which support for completing homework successfully is lacking.
3. Finally, integrate assessment tasks throughout the entire teaching/learning process rather than assigning them at the end of some specified time period (e.g., a week) or the completion of a unit of instruction. Assessment serves different functions at different points in the teaching/learning process. At the beginning, assessment can provide you with important information about what students know and can do (and do not know and cannot do) before instruction begins. In the middle, assessment can give you information about how well things

are going so that changes can be made, if necessary, to ensure overall learning success. In the end, assessment can provide you with the data you need to assign and justify the grades or marks on students' report cards.

**Suggested Readings:** Anderson, Ryan & Shapiro, 1989; Haberman, 1991; Jacobs & Morita, 2002; Logan, 1985; Murphy, 2003

### **3.BECOME THE 'GUIDE ON THE SIDE'**

*The proper implementation of task-based learning for economically disadvantaged students requires significant changes in the roles and responsibilities of teachers and students.*

#### **Research Findings**

Consider a movie or a stage play. There are three principle roles: directors, actors, and audience members. In many if not most classrooms, teachers are actors, students are members of the audience, and supervisors or administrators are directors. In fact, several articles and at least one book have been written advocating teaching as a "performing art." To properly implement task-based learning, these roles must change. The teacher becomes the director and the students are the actors. There may be multiple audiences at different times (e.g., administrators, supervisors, or parents) or there may be no audience at all, just actors and the director (as would be true in dress rehearsals).

As directors, teachers must attend to the "big picture" – that is, the settings (physical, social, and emotional), the actions and interactions of the actors in those settings, and the interactions of the actors with the director. Borrowing from drama theory, the term used to describe this "big picture" is "scenario". Scenarios differ from traditional lesson plans in at least two respects. First, lesson plans typically focus on content, whereas scenarios focus on contextually-based, task-directed, content-embedded activities. Second and directly related to the first, lesson plans often emphasize what teachers should say and do to "deliver" instruction. Scenarios, on the other hand, focus on



what students should say and do to complete the task and master the objectives. In this regard, it is interesting to note that the indicators found on virtually all teacher evaluation instruments in the United States focus on teachers, not students.

This shift in roles and responsibilities is consistent with the generally accepted theory that learning involves constructing knowledge (rather than merely reproducing it) by means of asymmetric social interactions with more competent partners. Furthermore, learning is not an individual, isolated, de-contextualized act; rather, learning is situated in particular contexts (historical, social, cultural, and environmental). Simply stated, academic learning quite often involves internalizing cognitive activities within social settings.

### **Implications for Educators**

1. Design scenarios rather than prepare traditional lesson plans.

Each scenario should (a) have a clear purpose, (b) enable students to become and remain actively engaged in learning, (c) assist students in achieving challenging learning goals and objectives, and (d) empower students to develop new forms of thought and ways of thinking. When classroom learning environments are conceptualized as scenarios, students become apprentices who see how knowledge is used in competent performance as they gain proficiency themselves.

2. Within these scenarios (and borrowing from Ted Sizer), assume the role of “guides on the side,” rather than “sages on the stage.” This is not to suggest that you never talk to or with your students. Rather, this is to suggest that when you do talk, what you say should be focused, clear, and fairly brief, just long enough to get the point across. The vast majority of classroom time should be monitoring students’ work, listening to discussions (redirecting them as necessary), asking clarifying and probing questions, and serving as a learning resource when needed.

3. Because an emphasis on active learning is often associated with a great deal of classroom activity, it is easy to lose perspective. To

maintain a proper perspective, you must achieve a balance between what students do and what students learn. It is important to remember that students should not learn activities, they should learn from activities. Students must be reminded of the purpose of activities (that is, the learning objectives). This can be accomplished by stopping them periodically and having them answer the question “What have you learned?”. If students can recount what they have done in class, but cannot articulate what they have learned, the design and/or implementation of the scenarios should be modified.

**Suggested Readings:** Darling-Hammond, 2012; Glaser, 1991; Hyslop-Margison & Strobel, 2008; Pešikan, 2010; Sarason, 1999; Sizer, 1997.

#### **4.FOCUS ON LEARNING STRATEGIES**

*Focusing on learning in addition to contents coverage is key to successfully implementing task-based learning for economically disadvantaged students.*

##### **Research Findings**

Virtually all educational objectives can be written in a common format: subject-verb-object. The student (subject) will contrast (verb) poetry, drama, and prose (object). The student (subject) will apply (verb) a variety of properties to simple algebraic expressions (object). The object represents the content to be learned. The verb indicates how students are expected to process that content. When teachers focus exclusively on content, they leave the choice of process to the student. In the first example, if the teacher only talks about poetry, drama, and prose, some students may memorize definitions, others may decide that they prefer drama to poetry and prose, and still others may focus on the differences among them. If the assessment is aligned with the objective, it seems reasonable to expect that the last group will perform the best. In this case, students are not being penalized for failing to learn the content; rather, they are being penalized for choosing and using the wrong learning process.

When students learn, they must rely on two kinds of prior knowledge: content knowledge and knowledge about how to learn content. Economically disadvantaged students often lack requisite background knowledge. If they do possess the knowledge, it may be disorganized and/or cognitively inaccessible. In addition, economically disadvantaged students often show substantial deficits in their awareness of their cognitive and metacognitive strategies as well as those strategies that produce more effective learning. Cognitive strategies are inherent in the verbs included in the statements of objectives (e.g., contrast, apply). Metacognitive strategies, on the other hand, are more generic in that they apply to multiple objectives and, often, to multiple subject areas (e.g., elaboration, keyword mnemonics, imagery).

This shift from “transmitting content” to “providing strategies” mirrors the aforementioned shift from a focus on teachers teaching to an emphasis on students learning. Both of these shifts are made easier within the context of task-based learning. When students are given true learning tasks, they must – individually or collectively – determine how they intend to work on and complete the task. They must also retrieve prior knowledge that is necessary for or facilitative of task completion and mastery of the objectives.

### **Implications for Educators**

1. When teaching economically disadvantaged students, work to achieve a balance between content and process. Performing an activity or using a strategy, but learning nothing by doing so, is unacceptable. You can achieve this balance by continually emphasizing the importance of monitoring and evaluating. Monitoring involves answering pairs of questions such as “Am I making progress?” (the task) and “What am I learning?” (the objective). Evaluating involves pairs of questions, such as “Have I accomplished the task on time and am I proud of my accomplishment?” and “Have I learned what I should have learned?”. Within the context of metacognition, monitoring and evaluating are key components of self-regulation.
2. Help students understand that different strategies are more or less useful

for different kinds of learning. Mnemonic and rehearsal strategies are intended to help students remember key facts or concepts. Strategies such as self-explanation and re-reading are most useful for facilitating understanding. Finally, strategies such as summarization, outlining, and highlighting text are intended to help students analyze and organize what they are attempting to learn. Matching strategies with intended learning outcomes, then, is another way of balancing content with process.

3. Teach general strategies to all students, while at the same time encouraging them to invent their own. There is, for example, a very useful four-step strategy for working on longer-term tasks: (a) organize/plan, (b) manage the work (e.g., ensuring that all resources are available, setting interim deadlines to ensure a proper pace), (c) monitor progress, making adjustments as necessary, and (d) evaluate the quality of the work. Within each of these fairly large steps, however, students can experiment with strategies that are unique to them as individuals or as members of a group. For example, what's the best way to get the information I (we) need? How should I (we) organize the work so I (we) meet the deadline?

4. Finally, go beyond the "correct answer" to explore how students arrived at their answers to questions or solutions to problems. What strategies did they use (if any)? Did they use the strategies properly? To find answers to these questions, you may ask students questions such as "How did you arrive at that answer or solution?" When attempting to balance content and process, both the correctness of the answers and arriving at the answers in appropriate and reasonable ways are important considerations.

**Suggested Readings:** Askill-Williams, Lawson & Skrzypiec, 2011; Donovan & Bransford, 2005; Dunlosky, 2013; Gaskins, 2005; Millar, 2004.

## **5. BE EXPLICIT ABOUT EXPECTATIONS**

*Teachers must ensure that economically disadvantaged students clearly understand the behavioral, academic, and social expectations of a task before they begin to work on it.*

**Research Findings**

To properly implement this principle, direct and explicit instruction is advisable. There is increasing evidence that the quality of student work is much better when teachers provide extensive directions for the tasks than when less detailed directions are provided. Understanding the task entirely before beginning work enables students to “see” and think about the “whole,” rather than focusing on the “parts.” Suppose, for example, students are given a short story and asked to analyze it in terms of a set of literary elements (e.g., plot, setting, character, theme, mood, and tone). Are they expected to read the short story in class, at home, or both? Is it permissible to work with other students? Are they encouraged to do so? Should they focus on each literary element individually or on the relationships between and among them? What is the nature of the final product (e.g., a test, an essay)? What is the deadline? How will the final product be evaluated? If the final product is a test, how many items must a student answer correctly to get a particular grade or mark? If the final is an essay, what are the evaluation criteria and performance standards? Is a rubric available to clarify performance expectations? Answers to these and similar questions are necessary if students are to fully understand the teacher’s expectations concerning all aspects of the task.

Why is this explicitness important for economically disadvantaged students? At least two reasons can be given. First, without answers to questions such as these, students are left to their own devices. When the expectations of students are inconsistent with those of the teacher, the likely results are confusion, poor performance, and, particularly with older students, resentment. Second, economically disadvantaged students may not understand the teacher’s expectations in terms of quality. What is an excellent score on a test and how is that determination made? What is an excellent essay or research paper? It is one thing to know that an essay needs to be of a certain length and should be written using a consistent manual of style. It is quite another to understand what makes an essay an excellent essay and, perhaps more importantly, how an excellent essay differs from a mediocre or poor one.

**Implications for Educators**

## 1. Connect behavioral and academic expectations whenever possible.

One of the most important things that economically-disadvantaged students can learn in schools is the connection between effort (behavioral) and achievement (academic). Economically disadvantaged students are often told they are not smart enough to learn difficult or complex material. Such statements quite naturally lead to an ability-achievement connection. “I cannot learn no matter how hard I try” is a comment often heard during interviews with economically disadvantaged students. The expectancy-value theory of achievement motivation states that students will put forth the effort needed to learn if they value what they are learning and if they expect to be successful in their attempts to learn it. Therefore, helping economically disadvantaged students forge a link between effort and achievement will quite likely enhance their motivation.

2. Communicate explicit performance standards that define acceptable and/or excellent performance. In evaluation, the criteria are the factors or aspects that are taken into consideration in making a judgment about the quality of work or learning. For example, organization, clarity, and mechanics are criteria often used to evaluate essays. “Mechanics” refers to sentence structure (including subject-verb agreement), word choice, spelling, and punctuation. A performance standard defines what is acceptable or excellent for each criterion. The statement, “All your papers should be free or almost free from errors”, is a performance standard associated with mechanics. When a task is assigned, it is important to communicate explicit performance standards. If the task is the completion of a problem set in mathematics, the performance standard would state the number of problems that need to be solved correctly. [In this example, the sole criterion is correctness.] If the task is a written report, then rubrics can be used to communicate both criteria and performance standards. If rubrics are used, however, it is important when working with economically disadvantaged students to give them opportunities to apply the rubric to written reports that differ in their quality so that they begin

to understand what differentiates acceptable from unacceptable or excellent from “less than excellent”.

3. For tasks that require multiple weeks to complete, establish a series of deadlines for completing and submitting work. For example, “I want to see an outline of what you are proposing by February 1<sup>st</sup>. Then, I want to see a rough draft of your report by February 21<sup>st</sup> and a final draft of the report by March 4<sup>th</sup>.” These benchmarks permit students to feel that they are making progress, while at the same time allowing teachers to give feedback that will likely result in superior products being produced.

**Suggested Readings:** Hattie, 2009; Rust, Price & O’Donovan, 2003; Sadler, 1998; W’igfield, A. & Eccles, 2000; Wolf & Stevens, 2007.

## **6. INTEGRATE LESSONS THROUGH PROBLEM-BASED LEARNING**

*Tasks that require multiple days or weeks to complete provide economically disadvantaged students with greater flexibility in learning time and enable them to integrate bodies of knowledge and apply clusters of skills.*

### **Research Findings**

As mentioned in our discussion of Principle 2, much of the teaching experienced by economically disadvantaged students can be understood as a series of “talk-work” sequences. The work tends to be assigned daily and is given to students as practice or as an assessment of their learning. Although these daily assignments have some value, they have at least two negative consequences. First, they emphasize discrete rather than integrated learning. In discrete learning, students master one lesson or objective and move on to the next. In integrated learning, connections between and among lessons and objectives are emphasized. Second, the assignments are intended to be completed in a limited amount of time: if not the same day then the next day. As a

consequence, there is little, if any, time to re-teach what has not been learned or has been learned poorly.

Project-based or problem-based learning (PBL) is an approach that emphasizes learning tasks that are integrative and typically require multiple weeks to complete. The difference between conventional instruction and PBL can be seen quite clearly in the field of second language learning (SLL). Conventional SLL instruction is based on the assumption that students need to be taught grammatical and linguistic structures and rules before they can communicate. The use of PBL in SLL is based on the assumption that students learn a language (including its structure and rules) by communicating.

The overall project task is presented as an open-ended question, typically referred to as a “driving question.” Examples include “What is the quality of air in my community?” and “How are good and evil depicted in different cultures?” Students are explicitly told (1) what the task is, (2) what they must do to complete the task, and (3) what they must submit once the task is complete (i.e., the deliverable).

Although PBL requires more planning than conventional teaching, the Internet provides a great deal of support for planning and implementing PBL as well as WebQuests that students can complete on-line. The Buck Institute for Education’s website ([bie.org](http://bie.org)) contains a checklist of the essential elements of PBL. The website <http://webquest.org/> provides useful information about the design and use of WebQuests as well as several examples.

Existing research suggests that PBL is often more beneficial for economically disadvantaged students than for their more advantaged peers. In some cases, participation in PBL has virtually erased the achievement gap between students from high- and low-socioeconomic backgrounds.

### **Implications for Educators**

1. Start small! One of the biggest mistakes teachers make in



implementing PBL is to think too big. Initially, projects should take no more than a week or two to complete. Rather than doing real-world fieldwork, fieldwork can be simulated in the classroom, using technology if necessary and available.

2. Design or select tasks, particularly driving questions, that are authentic, relevant, and meaningful (see Principle 1). Asking students what they are interested in learning about a particular subject, what problems they see in society at large, and/or what questions are being asked by experts in specific subject areas may provide useful information for formulating appropriate questions. Complete tasks can then be built around these questions.

3. Do not use PBL with objectives that focus on memorizing large amounts of factual information. When memorization is the goal, more conventional teaching methods are more likely to produce positive results since these methods allow more material to be covered in less time.

4. Finally, model the inquiry process when working with students as they work on their projects. Spend more time asking questions than giving answers. Suggest additional data that may be useful to consider, encourage them to draw conclusions based on the data, and demonstrate how to communicate these conclusions clearly to a variety of audiences.

**Suggested Readings:** Abbitt & Ophus, 2008; Halvorsen et al., 2012; Milson, 2002; Murphy, 2003; Nunan, 2004.

## **7. INCORPORATE COOPERATIVE TASKS**

*Cooperative tasks enable economically disadvantaged students to acquire the social- interpersonal and metacognitive skills they will need to be successful in life.*

### **Research Findings**

Recruiters at major corporations report that a lack of technical skills is not an issue in finding qualified applicants; rather, the problem is a

lack of human relations or “people” skills. Surveys of employers consistently show that more than half of job applicants are deficient in their interpersonal skills. Surveys of managers suggest that they spend the vast majority of their time (as high as 95%) dealing with personnel matters. More than two decades ago, the American Association for the Advancement of Science argued that a core practice of scientific inquiry is collaborative work. Therefore, schools should engage students in classroom tasks that require joint efforts to complete.

Although teachers using more conventional methods tend to view student-student communication as disruptive and potentially problematic, most task-based approaches provide ample opportunities for student-to-student communication and collaborative work. Cooperative learning is one such approach. Simply stated, cooperative learning is a form of active learning in which students work together to perform specific tasks in small groups. Each cooperative learning group is carefully selected so that a heterogeneous structure allows each student to bring his or her strengths to the group effort and benefit from the strengths of other members of the group. As should be obvious, cooperative learning is quite compatible with project-based learning (see Principle 6). However, whereas the focus of project-based learning is the end result (that is, the completion of the project), a major focus of cooperative learning is on the process by which the end result is achieved.

The evidence suggests that lower-achieving students (a group that contains large numbers of economically disadvantaged students) benefit the most from working in heterogeneous groups, particularly in the areas of interpersonal and self-regulation skills. Because economically disadvantaged students are more likely to experience residential instability, psychological distress among adults, and low quality childcare settings, they are less likely to develop the self-regulation skills that have been associated with improved academic outcomes.

### **Implications for Educators**

1. Because students must learn social-interpersonal skills just as they

learn skills in any academic area, you should (a) select tasks that require collaboration, (b) explain the tasks and the importance of working together to complete the task, (c) structure the group work so that each student knows what he or she is expected to do, (d) model strategies for collaboration and conflict resolution, and (e) help students learn to evaluate the quality of their work both in terms of process and product. The jigsaw technique (see [www.jigsaw.org](http://www.jigsaw.org)) is often used to encourage collaboration since each student has a unique part to play in completing the task.

2. Pay attention to two often competing factors when designing and implementing cooperative learning: (a) group goals and (b) individual accountability. With a common goal, group members are more likely to be willing to help one another; higher achieving students deepen their learning by explaining concepts to peers and lower achieving students benefit from the additional support offered by peers. Without individual accountability, however, some group members may choose not to participate in the task at hand. Alternatively, a single member of the group may decide to take charge and do everything, minimizing the participation of the other members of the group.

3. Make sure that all students understand what is to be accomplished by the group and how it is to be accomplished in the group. Group work can be frustrating if instructions are unclear. Clear instructions not only explain the task but also specify the time allocated. As a general rule, it is better to allow too little time initially and then expand it as the need arises, rather than give students a 20-minute activity that many groups will complete in 10 minutes.

4. Keep groups together long enough for the group members to establish positive working relationships and establish trust. Students need time to become acquainted, to identify one another's strengths, and to learn how to support and coach one another. This is not to suggest that the same groups should persist for an entire semester or year. Within a semester, two regroupings may be as an optimal number.

**Suggested Readings:** American Association for the Advancement of Science, 1989; Duckworth, Akerman, MacGregor, Salter & Vorhaus,

2009; International Association of Administrative Professionals, 2014; Johnson & Johnson, 2009; Lubliner & Smetana, 2006.

## **8. ACKNOWLEDGE AND ACCOMMODATE STUDENT DIVERSITY**

*When teaching economically disadvantaged students, a wide range of tasks should be included to accommodate student diversity.*

### **Research Findings**

Although we have used the phrase “economically disadvantaged students” throughout this booklet, anyone who works with these students knows that economically disadvantaged students do not form a homogeneous group. Furthermore, the meaning of “economically disadvantaged” differs from country to country and from culture to culture. When countries are compared on international tests such as the Program for International Student Assessment (PISA) tests, the results are likely impacted by some combination of economic and cultural “disadvantage”. On such tests, there is ample evidence that, as a group, economically disadvantaged students achieve lower scores than their more advantaged peers. In addition, critics of PISA have argued that differences between countries can be attributed at least in part to the failure to take into consideration cultural differences (especially including language differences) when designing the tests and interpreting the test results.

Although there has been a great deal of emphasis on equal opportunity over the past half-century or more, it is instructive to point out that the Preface to the UNESCO Constitution, signed in November, 1945, includes the phrase “full and equal opportunities for education for all.” “Full opportunity” means that each student, regardless of cultural and economic background, must be provided with the best education possible. “Full opportunity” means accommodating students’ diversity in ways that provide maximum learning opportunity, rather than treating all students exactly the same (which would meet some people’s definition of equal opportunity).

The concept of accommodation is closely related to the concept of fairness. Because fairness is fundamentally a socio-cultural issue, it must be addressed in all aspects of education – curriculum, instruction, classroom rules and routines, assessment, and evaluation. Fairness includes the ways in which cultural and linguistic diversity is approached; the extent to which the content of tasks reflects the experiences of different groups; and the availability of resources for different groups.

In the context of task-based learning, fairness means paying attention to the language, examples, illustrations, and expectations included in tasks. Fairness also means paying attention to the ways in which you interpret and evaluate how students work on tasks and the quality of the work they produce. As teachers examine the tasks they design and/or select, then, they should ask one fundamental question: “Am I providing full and equal opportunities for all my students?”

### **Implications for Educators**

1. Provide variety. There is an old saying that variety is the spice of life. Variety is also important when dealing with classroom diversity. For any given objective, there are many tasks that are appropriate. For any given task, there are many activities that are appropriate. For any given task and objective, there are many ways in which work and learning can be assessed. Suppose, for example, students are working on a task based on the question, “Which is colder, the North Pole or the South Pole?” They can obtain the needed information by reading, watching videos, or interviewing experts. They can demonstrate their learning by writing a formal research report, preparing and presenting a PowerPoint, completing a graphic organizer, or taking a test. These different activities and assessments provide diverse opportunities for students to learn as well as to demonstrate their learning.
2. Our second implication follows from the first. Permit students to choose from a limited, approved set of alternative activities, assignments, and materials. In some cases, students can work with the teacher to design complete tasks. Imposing limits on student choice is

necessary to ensure that the choices are consistent with the learning objective(s). For example, a student cannot choose to do narrative writing when the task requires persuasive writing. The key here is to separate substance from form. The substance of the task (e.g., content, cognitive demands) must be the same for all students. The form of the task (e.g., how to learn and how to demonstrate that learning has occurred) can differ.

3. Work diligently to build relationships with all students, regardless of their economic status, gender, racial identity, or cultural background. In addition, model the behavior you expect from you students. The learning environment, whether defined as the classroom or small groups within the classroom, should be characterized by egalitarian norms and acceptance of diversity. Full participation by all students is always expected, if not demanded. Mutual respect should be evident in every interpersonal transaction, whether it is teacher-student, student-teacher, or student-student. When classrooms and groups within classrooms are characterized by egalitarian norms, acceptance of diversity, full participation, and mutual respect, students experience a sense of belonging. A sense of belonging is a factor repeatedly found to predict the likelihood of staying in school, rather than dropping out.

**Suggested Readings:** Cole, 2008; Cruzan & Kaluszka, 2010; Iviã, Pešikan & Antiã, 2013; Stobart, 2005; Wuttke, 2007.

### CONCLUSION

This booklet has highlighted the principles to consider when developing content and curricula to improve the quality of education for economically disadvantaged students. For low-achieving or “struggling” students, a group that quite often includes numerous economically disadvantaged students, engagement in classroom tasks is critical for motivation. Engagement can come through the use of authentic, relevant, and meaningful content that allows students to connect what they are learning to the outside world, to their needs

and interests, and to their prior learning. In addition, by reversing the normal “talk-work” sequence in the classroom to “work-talk” or “talk and work”, teachers can better observe what students are retaining during learning tasks before moving ahead to assessment and practice lessons.

Adjusting the classroom paradigm by placing the student as the main actor and the teacher as the director providing succinct and helpful feedback from the “side” allows teachers to attend to the “big picture” and plan content and activities depending on the context. Furthermore, focusing on helpful learning strategies – including those unique to each student – is important for students who often show substantial deficits in their awareness of the strategies that produce more effective learning. As noted earlier, economically disadvantaged students are often told they are not smart enough to learn difficult or complex material. Therefore, ensuring that students value what they are learning and expect to be successful in their attempts to learn it is key to motivation.

Project-based or problem-based learning (PBL) is an approach that emphasizes learning tasks that are integrative and typically require multiple weeks to complete, allowing students the flexibility to catch up on learning time and utilize skill clusters. Similarly, encouraging collaboration and cooperation through group activities, both short-term and semester-long, allows students to utilize their strengths, learn from their peers, and build inter-personal and self-regulation skills often lacking in their outside environments. Finally, acknowledgment of student diversity and an emphasis on egalitarian norms, full participation, and mutual respect among all classroom participants is central to fostering quality education for economically disadvantaged students.

**REFERENCES (*Reference styles as provided in original publication are not of JAIAER*)**

Abbitt, J. & Ophus, J. (2008). What we know about the impacts of WebQuests: A review of research. *AACE Journal*, 16, 441-456. American Association for the Advancement of Science (1989). *Science for all Americans: Project 2061*. New

York: Oxford University Press.

Anderson, L. W., Ryan, D. W., & Shapiro, B. J. (1989). *The IEA Classroom Environment Study*. Oxford: Pergamon Press.

Askill-Williams, H., Lawson, M. J., & Skrzypiec, G. (2011). Scaffolding cognitive and metacognitive strategy instruction in regular class lessons. *Instructional Science, 40*, 413-443.

Cole, R. W. (2008). *Educating everybody's children: Diverse teaching strategies for diverse learners, Second edition*. Alexandria, VA: ASCD.

Cruzan, D. & Kaluszka, C. (2010). *Motivation and assessment: The impact of choice on motivation in classroom assessments*. Unpublished manuscript, Virginia Polytechnic Institute and State University, Blacksburg, VA. Retrieved July 24, 2014 from <https://scholar.vt.edu/access/content/user/dcruzan/PortfolioPublic/ActionResearchProjectFinal.pdf>

Darling-Hammond, L. (2012). *Creating a comprehensive system for evaluating and supporting effective teaching*. Palo Alto, CA: Stanford Center for Opportunity Policy in Education.

Donovan, M. S., & Bransford, J. D. (Eds.). (2005). *How students learn: History, mathematics, and science in the classroom*. Washington, DC: National Academies Press.

Doyle, W. & Carter, K. (1984). Academic tasks in classrooms. *Curriculum Inquiry, 14*, 129-149.

Duckworth, K., Akerman, R., MacGregor, A., Salter, E. & Vorhaus, J. (2009). *Self-regulated learning: Literature review*. London: Centre for Research on the Wider Benefits of Learning, Institute of Education, University of London.

Dunlosky, J. (2013). Strengthening the student toolbox: Study strategies to boost learning. *American Educator, 35*(3), 12-21.

Gaskins, I. W. (2005). *Success with struggling readers: The Benchmark School approach*. New York: Guilford Press.

Glaser, R. (1991). The maturing of the relationship between the science of learning and cognition and educational practice. *Learning and instruction, 1*(2), 129-144.

Haberman, M. (1991). The pedagogy of poverty versus good teaching. *Phi Delta Kappan, 73*, 290-94.

Halvorsen, A., Duke, N. K., Brugar, K. A., Block, M. K., Strachan, S. L., Berka, M. B. & Brown, J. M. (2012). Narrowing the achievement gap in



second-grade social studies and content area literacy: The promise of a project-based approach. *Theory and Research in Social Education*, 40, 198-229.

Harris, C. & Marx, R. (2009). *Authentic tasks*. Retrieved on January 15, 2005 from <http://www.education.com/reference/article/authentic-tasks/>.

Hattie, J. A. C. (2009). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. London: Routledge.

Hunt, B. C. (2009). *Teacher effectiveness: A review of international literature and its relevance for improving education in Latin America*. Washington, DC: PREAL.

Hyslop-Margison, E. & Strobel, J. (2008). Constructivism and education: Misunderstandings and pedagogical implications. *The Teacher Educator*, 43(1), 72-86

International Association of Administrative Professionals (2014). *Interpersonal skills most important factor in career advancement*. Retrieved June 26, 2014 from <http://www.iaap-hq.org/resources/interpersonal-skills-most-important-factor-career-advancement>.

Iviã, I., Pešikan, A. & Antia, S. (2013). *Textbook quality: A guide to textbook standards*. Gottingen, Germany: V&R Unipress.

Jacobs, J. K. & Morita, E. (2002). Japanese and American teachers' evaluations of videotaped mathematics lessons. *Journal for Research in Mathematics Education*, 33, 154-175.

Johnson, D. W. & Johnson, R. T. (2009). An educational psychology success story: Social interdependence theory and cooperative learning. *Educational Researcher*, 38, 365-379.

Logan, G. D. (1985). Skill and automaticity: Relations, implications, and future directions. *Canadian Journal of Psychology*, 39, 367-86.

Lubliner, S. & Smetana, L. (2006). The effects of comprehensive vocabulary instruction on Title I students' metacognitive word-learning skills and reading comprehension. *Journal of Literacy Research*, 37, 163-200.

MacGregor, R. R. (2007). *The essential practice of high quality teaching and learning*. Bellevue, WA: Center for Educational Effectiveness.

Mayer, R. E. (2001). Rote vs. meaning learning. *Theory into Practice*, 41, 226-232.

- Millar, R. (2004). *The role of practical work in the teaching and learning of science*. Washington, DC: National Academy of Sciences.
- Milson, A. J. (2002). The Internet and inquiry learning: Integrating medium and method in a sixth grade social studies classroom. *Theory and Research in Social Education, 30*, 330-353.
- Murphy, J. (2003). Task-based learning: The interaction between tasks and learners. *ELT Journal, 57*, 352-360.
- National Survey of Student Engagement. (2013). *A fresh look at student engagement—Annual results 2013*. Bloomington, IN: Indiana University Center for Postsecondary Research.
- Nunan, D. (2004). *Task-based language teaching*. Cambridge: Cambridge University Press.
- Pešikan, A. (2010). Savremeni pogled na prirodu školskog učenja i nastave: socio-konstruktivističko gledište i njegove praktične implikacije (Contemporary view of the learning and teaching: Socio-constructivist perspective and its practical implications). *Psihološka istraživanja, 13*(2), 157-185.
- Roberson, R. (2013). Helping students find relevance. *Psychology Teacher Network*. Retrieved on January 15, 2005, from <http://www.apa.org/ed/precollege/ptn/2013/09/students-relevance.aspx>.
- Rust, C., Price, M., & O'Donovan, B. (2003). Improving students' learning by developing their understanding of assessment criteria and processes. *Assessment and Evaluation in Higher Education, 28*(2), 147-164.
- Sadler, D. R. (1998). Formative assessment: Revisiting the territory. *Assessment in education, 5*(1), 77-84.
- Sarason, S. (1999). *Teaching as a performing art*. New York: Teachers College Press.
- Shernoff, D. J., Csikszentmihalyi, M., Schneider, B., & Shernoff, E. S. (2003). Student engagement in high school classrooms from the perspective of flow theory. *School Psychology Quarterly, 18*, 158-176.
- Sizer, T. (1997). *Horace's school: Redesigning the American high school*. Boston: Mariner Books.
- Stobart, G. (2005). Fairness in multicultural assessment systems. *Assessment in Education, 12*(3), 275-287.
- Wigfield, A. & Eccles, J. S. (2000). Expectancy-value theory of achievement motivation. *Contemporary Educational Psychology, 25*, 68-81.

Wolf, K. & Stevens, E. (2007). The role of rubrics in advancing and assessing student learning. *Journal of Effective Teaching*, 7 (1), 3-14.

Wuttke, J. (2007). Uncertainties and bias in PISA. Retrieved July 21, 2014 from [http://www.oxydiane.net/IMG/pdf/Uncertainties\\_and\\_Bias\\_in\\_PISA.pdf](http://www.oxydiane.net/IMG/pdf/Uncertainties_and_Bias_in_PISA.pdf).

### **Acknowledgement**

Task, Teaching and Learning: Improving the Quality of Education for Economically Disadvantaged Students by Lorin Anderson, and Ana Pešikan (Educational Practice Series 27 of the International Bureau of Education, Geneva, Switzerland) was produced in 2014 by the International Academy of Education (IAE), Palais des Académies, 1, rue Ducale, 1000 Brussels, Belgium, and the International Bureau of Education (IBE), P.O. Box 199, 1211 Geneva 20, Switzerland. The publication states that “It is available free of charge and may be freely reproduced and translated into other languages. Please send a copy of any publication that reproduces this text in whole or in part to the IAE and the IBE.”

*Journal of All India Association  
for Educational Research  
Vol.28, No. 2, December 2016, 106-120*

### **STATUS OF CONTINUOUS AND COMPREHENSIVE EVALUATION AT ELEMENTARY STAGE**

B.N. Panda, Professor and Head, Dept. of Education, Regional Institute of Education (NCERT), Bhubaneswar, Odisha

#### **INTRODUCTION**

Many Central and State policies (mid-day meal, free text-books, uniform and bicycles, etc.) articulate the school's responsibility to ensure that all students have access to the core curriculum in the general education environment whenever possible with appropriate supports and services. In spite of well-intentioned effort from all quarters, more than 50 percent of children leave school before completion of elementary education and those who remain do not achieve as desired. The major factor is that children do not find school interesting and enriching. A faulty examination system in India not only discourages learning, but also snuffs out creativity. Such examinations retard the joy of learning, create fear and anxiety for students and perpetuate dropout among majority of children. In such a dismal state, there is a need for new forms of assessment which can support children's physical, social and cognitive development.

Recommendations of NCF-2005 and RTE Act, 2009 have made it imperative to pursue the scheme of continuous and comprehensive evaluation in schools throughout the country. CCE advocates a school-based continuous and comprehensive evaluation system in order to: (i) reduce stress of children; (ii) make evaluation comprehensive and regular; (iii) provide space for the teachers for creative teaching and (iv) provide a tool for diagnosis and for producing learners with greater skills (Panda, 2005, 2012, 2013 and 2014). Even if the scheme of CCE is in operation in some states as a consequence of the earlier recommendations by the commissions

and policies, the practices in CCE are in varied forms due to absence of clear cut policy in this regard. It is desirable that a common national structure of education should follow a common policy of CCE and strategy for teacher training throughout the country.

The present study titled “**Status of Continuous and Comprehensive Evaluation at Elementary Stage**” was taken up for the States of Odisha, West Bengal, Bihar and Jharkhand involving teachers, students, guardians / parents and community members from different categories of elementary schools.

### **OBJECTIVES**

The specific objectives of the study are:

- 1.To study the present status of continuous and comprehensive evaluation in the elementary schools of Bihar, Jharkhand, Odisha and West Bengal
- 2.To study the awareness level of the elementary school teachers of Bihar, Jharkhand, Odisha and West Bengal regarding continuous and comprehensive evaluation.
- 3.To study the attitude of elementary school teachers of Bihar, Jharkhand, Odisha and West Bengal towards continuous and comprehensive evaluation.
- 4.To study the views/opinions of the elementary school students of Bihar, Jharkhand, Odisha and West Bengal about the issues in the implementation of continuous and comprehensive evaluation system.
- 5.To study the awareness of the parents/community members of Bihar, Jharkhand, Odisha and West Bengal about the system of continuous and comprehensive evaluation.
- 6.To develop a training package for the elementary school teachers working in mono-grade and multi-grade contexts and in rural and urban areas of Bihar, Jharkhand, Odisha and West Bengal

### **SAMPLE**

In this survey type research, 48 elementary schools with 12 schools from each of the states of Bihar, Jharkhand, Odisha and West Bengal

having classes from I-VIII were selected using stratified random sampling procedure. Initially 3 districts were selected randomly from each state. But due to natural calamity of flood, Samastipur district in Bihar was replaced by Gaya and Deojhar district in Jharkhand was replaced Ranch-2. Four schools were selected from each district. The entire sample had 24 urban schools and 24 rural schools with 20 mono-grade schools and 28 multi-grade schools. The sample consisted of 48 head teachers, 247 teachers of the 48 sampled schools, 245 parents and community members from habitations near the sampled schools, 510 students and 24 district-level education officers.

### **TOOLS**

The following tools were developed, finalized and used after being translated into Odia, Bengali and Hindi languages: (i) *Information schedule on CCE for the head-teachers*, (ii) *Focus group discussion schedule with students on CCE*, (iii) *Awareness schedule for teachers on CCE at elementary stage*, (iv) *Attitude scale for teachers on CCE at elementary stage*, (v) *Awareness schedule for parents/ community members on CCE at elementary stage*.

### **PROCEDURE**

Two Junior Project Fellows (JPFs) appointed specifically for the project visited the sampled schools of different states for collecting data following the guidelines provided in the respective tools in different phases during the period from 16<sup>th</sup> August to 5<sup>th</sup> October, 2011. The Project Coordinators, Planning Coordinators, Pedagogy Coordinators, Block Research Centre Coordinators and Cluster Resource Center Coordinators of respective sample districts were consulted and associated. The data were analyzed with the help of descriptive statistics and are presented in the form of Tables and Graphs.

### **MAJOR FINDINGS**

#### **STATE OF BIHAR**

- The CCE has been introduced in the State of Bihar with the initiative of Bihar Education Project Council (BEPC) through

Sarva Shiksha Abhiyan (SSA) in a phased manner. Whereas student progress in curricular areas is assessed in all the sampled schools, assessment of curricular activities and personal-social qualities are assessed in less number of schools.

- The head teachers' appreciation of CCE is weak. Nearly 60% of the head teachers feel that parents as well as students do not appreciate CCE.
- While written and oral tests are frequently used, emphasis on checklist, rating scale, anecdotal records and projects is weak. Annual tests are used for assessment of curricular areas in all the schools followed by half-yearly, quarterly and class tests; diagnostic and unit tests are used much less frequently.
- Irrespective of the area in which the student is assessed, individual assessments are more frequent than group assessment. Self-assessment is done much less frequently and peer-assessment is not done at all. Information from parents and community members is rarely used for assessing students.
- In maximum cases, both marks and grades are used for reporting assessment results in curricular areas, whereas note/diary is used for the same in curricular activities and personal-social dimension. Assessment in curricular areas is shared with parents and is largely used for promotion but assessment of curricular activities and personal-social qualities is shared very minimally.
- The head teachers feel that CCE is not satisfactorily implemented because of certain difficulties such as inadequate teaching staff, overcrowded classroom, excess workload for the teacher, engagement of teachers in other activities, poor attendance of students and inadequate infrastructural facilities.
- CCE can be successfully implemented by maintaining appropriate PTR, training teachers in CCE, frequent monitoring and supervision, appointing subject teachers, improving school infrastructure and raising awareness of important stakeholders including parents and community members.
- There is more emphasis on annual examination than weekly and monthly assessments. Majority of children suggest for more

number of unit tests, physical activities, more assignment on mathematics and science, computer training and literary activity.

- About 55 per cent of teachers are aware of CCE. Though teachers perceive CCE as having certain advantages over traditional approach, they feel that CCE is not satisfactorily conducted because of certain difficulties such as insufficient teaching staff, excessive pressure on teachers, irregularity of students, and high teacher-student ratio.
- The CCE scheme can be improved by enrolling students at appropriate stage, providing feedback to the teachers through students, organizing PTA meetings, appointing required number of teachers and non-teaching staff, non-engaging teachers in activities other than teaching, and training teachers on CCE.
- After observing the status of CCE in different schools of Bihar, the investigator felt that neither the parents nor the teachers of the sampled schools are aware of CCE. There is more emphasis on annual examination than weekly and monthly tests. The students are not satisfied with the examination system as they are not getting the report card of weekly and monthly examinations. The insufficient teaching-learning material and lack of parent-teacher meeting are the major constraints in CCE.

#### ***STATE OF JHARKHAND***

- The CCE has been introduced in Jharkhand with the initiatives of Jharkhand Education Project (JEP), the District Project Office (DPO), and the State Department of Education, Jharkhand in a phased manner from 2005 to 2010.
- Almost all the sampled schools in Jharkhand assess student progress in curricular areas whereas, 92 per cent and 84 per cent of schools respectively assess other curricular areas and personal-social qualities of the students. 67 per cent the sampled schools enquire about the health status of the students.
- All the personal-social qualities (except self-control and tolerance at the primary level) are assessed in two-thirds or more number of schools. More emphasis has been given to personal-social qualities at the upper primary level.



- Half of the teachers do not show acceptance for CCE and 84 per cent feel that CCE has increased the workload of teachers either moderately or to a great extent. While parental liking for CCE is good, student liking is relatively poor.
- More importance is attached to assessment in curricular areas and the least to the assessment of personal-social qualities. Techniques such as project, checklist, rating scale and anecdotal record are less frequently followed
- Class test, half-yearly test, diagnostic test and yearly tests are the most preferred options for assessment. Class test is highly preferred for curricular activities and class test and diagnostic tests are preferred methods for assessment of PSQs.
- In all components of CCE, individual and group-level assessments are done more frequently; self-assessment and peer-assessment are not given importance. Assessment is done mostly monthly, quarterly, half-yearly and annually in curricular areas; done monthly, half-yearly and annually in curricular activities; and done weekly/fortnightly and monthly in case of personal-social qualities.
- The information from parents is used for holistic assessment of students more frequently compared to information from the community members. In majority of schools, assessment information relating to all the three dimensions is shared with parents and children followed by their use for remediation and reporting purposes.
- In maximum cases, both marks and grades are used for reporting assessment results and note/diary is mostly used for recording and reporting assessment results in curricular activities and personal-social dimension.
- Around 58 per cent of head teachers at the primary level and 50 per cent at the upper primary level report that their teachers are trained on CCE. The head teachers feel that CCE is not satisfactorily implemented because of over-crowded classroom, excess teacher workload, engagement of teachers in other activities, non-cooperation of parents, and inadequate infrastructure.

- CCE can be successfully implemented by maintaining appropriate PTR, training teachers in CCE, frequent monitoring and supervision, appointing subject teachers, improving infrastructure, and raising awareness of important stakeholders including parents and community members through awareness campaigns, meetings and state-level seminars.
- Students feel that written, assignment and oral methods are generally used for evaluation and they are evaluated individually and not in groups. Marks are awarded in curricular areas and grades are given in PSQs and curricular activities. Majority of children want more number of unit tests, physical activities and more assignment on science and mathematics, computer training and remedial classes for continuous facilitation of students.
- Teachers' awareness of the provisions of CCE is weak. Gender differences and urban-rural differences are not substantial. Only one-third of teachers show favorable attitude towards CCE; parental attitude is not also very encouraging.
- The CCE scheme can be improved by providing feedback to the teachers, organizing PTA meetings, appointing required number of teachers and non-teaching staff, not engaging teachers in non-academic activities and training teachers on CCE.

#### **STATE OF ODISHA**

- The CCE has been introduced in the State of Odisha with the initiative of Odisha Primary Education Programme Authority (OPEPA) through Sarva Shiksha Abhiyan (SSA) in phases from 2002 to 2009.
- While all schools in Odisha assess students in curricular areas, PSQs and curricular activities are assessed in less number of schools. More importance is attached to the assessment in curricular areas and the least to the assessment of personal-social qualities.
- Almost 60 per cent of the head teachers appreciate the introduction of CCE scheme to a moderate level; none of them, however, appreciate it wholeheartedly. They feel that CCE has increased

the workload of teachers. Nearly half of students and parents like CCE while the rest do not show any liking for CCE.

- The observation, written, oral and assignment modes are preferred over methods such as project, checklist, rating scale and anecdotal record. While half-yearly, annual and unit tests are done on a cent percent basis for assessment in curricular areas, diagnostic and quarterly tests are rare. Individual and group level assessments of students are done more frequently compared to self- and peer-assessments. Both marks and grades are used for reporting assessment results in curricular areas; grades are mostly used for recording assessment results in curricular activities and personal-social dimension.
- One-third of the primary teachers and two-third of the upper primary teachers have at least one teacher trained in CCE. CCE can be successfully implemented by maintaining appropriate PTR, training teachers in CCE, frequent monitoring and supervision, appointing subject teachers, improving school infrastructure and raising awareness of important stakeholders including parents and community members.
- Students feel that mathematics, language, social science and science, art and physical education are continuously evaluated in elementary schools of Odisha. All aspects of PSQs are not assessed in all schools. Generally observation, written, oral and project methods are used for evaluation. Schools predominantly use class tests, unit test, and half-yearly and yearly examinations for assessment. Students are assessed individually as well as in groups in schools and in some of the schools peer-cum-self assessments are done. Generally mark is assigned in curricular areas whereas grades are assigned to PSQs.
- In most schools, students get appropriate feedback for the personal growth and progress. Most of the schools have provision of specially trained teachers to look after differently-abled children. Art and vocational education have not been implemented at a satisfactory level.
- Teachers' awareness of CCE is average. Rural teachers are more aware of CCE as compared to the urban teachers; no significant gender-difference is observed.

**STATE OF WEST BENGAL.**

- The CCE has been introduced with the initiative of West Bengal Board of Secondary Education and Sarva Shiksha Mission with effect from 2005.
- All schools assess student progress in curricular areas but PSQs and curricular activities are assessed in comparatively less number of schools. Fifty eight percent of the head teachers report that teachers appreciate CCE moderately as compared to the traditional method of evaluation. Half of the teachers feel that CCE has increased the workload of teachers. Liking for CCE by students, parents and community members is above-average.
- The techniques like written, oral, project, observation and rating scale are used for assessment of curricular areas in 50 to 75 percent of schools. Teachers use a variety of techniques for assessing curricular activities and PSQs.
- Class tests, unit tests and annual tests are mostly used for assessment of curricular areas and curricular activities. While curricular areas and curricular activities are focused more; personal-social qualities are focused less in assessment. There is more individual assessment in curricular areas and curricular activities; self- assessment is used for PSQs. So far as the frequency of assessment is concerned, it is done mostly monthly, quarterly and yearly. Using assessment information for remediation is rather weak.
- Assessment results are recorded both in terms of marks and grades; notes and diaries are used but less frequently. Assessment results in curricular areas are shared with parents; sharing with children is rather weak.
- Sixty per cent of the head teachers at the primary level and 92 per cent at the upper primary level report that their teachers are trained on CCE. The suggestions extended by the head teachers of West Bengal for effective implementation of CCE are: ideal PTR, reducing the number of evaluations, developing infrastructure facilities, organization of in-service training on CCE, frequent monitoring and supervision by the higher authorities, regular

meeting with stakeholders, proper planning and clarity in the format for recording progress of the child, and awareness programmes on CCE for the parents and community members.

- A large number of students feel that the present evaluation system is not student-friendly as it increases tension among them. Very few schools have the provision of special teaching-learning material and provision of extra classes. Most of the schools emphasize the curricular areas than the curricular activities and PSQ.
- Teachers' awareness of the CCE scheme is at average level. Rural teachers are more aware compared to their urban counterparts. Teachers' attitude towards CCE also does not project a healthy trend.

## **RECOMMENDATIONS**

### ***STATE OF BIHAR***

Assessment in curricular activities and PSQs needs to be strengthened on a cent percent basis in all the schools of Bihar. Teachers need to be oriented to accept CCE wholeheartedly. The government may provide a format to teachers for easily assessing and recording student progress. Teacher training in CCE should focus on the use of checklists, projects, rating scales and anecdotal records. Diagnostic tests should be frequently used and the results be used for remediation. Teachers also need to create provisions for self- and peer-assessment. Parents as well as community members should be sensitized to CCE to strengthen school-community linkage. The assessment results need to be shared with students and their parents in the form of grades and descriptive notes and diaries. The government might consider supplying student handbooks where teachers would record student progress for information of parents and use such information for remediation purposes. There is a strong need for recruiting teaching staff as per the norms of RCFCE Act, training them on CCE and reducing their non-academic workload to ensure their increased participation in the scheme of CCE. Besides formal tests, students feel that there should be more physical, cultural and literary activities,

exhibitions and assignments on mathematics and science and computer training.

### **STATE OF JHARKHAND**

Though comparatively, Jharkhand scenario is better than Bihar, the assessment of students in curricular activities and personal-social qualities needs to be strengthened. A format for assessment and recording of student progress may be provided to teachers. Teachers' acceptance of the scheme of CCE needs to be ensured on a cent percent basis by training all teachers on CCE and providing them a format for easily recording the assessment results. The techniques such as projects, checklists, rating scales and anecdotal records are less frequently used. These techniques along with diagnostic tests should be more frequently used. Each student may be provided with a handbook containing assessment format on which teachers can record assessment results. The training modules for teachers should emphasize these aspects and impress upon them the importance of self- and peer assessments. Community members should be sensitized to CCE to develop acceptance for the assessment techniques used by teachers. SMC, PTA and MTA meetings can be used as platforms for creating community awareness and using members as a source for obtaining information regarding student assessment. Leaflets describing the importance and procedure of CCE may be distributed to community members and be displayed in community centers. Teachers should gradually shift to reporting assessment results in the form of grades rather than marks and clarifying student strengths by descriptive notes and diaries, which they can also use for purposes of remediation. All teachers should be exposed to in-service training on CCE. The weakness, if any, at the stage of implementation must be corrected through appropriate on-site academic and monitoring support. The problems which teachers face in implementing CCE are more or less universal and should be dealt with by appropriate governments in a more or less similar manner. The government would facilitate CCE implementation by recruiting staff as per norms of RCFCE Act, training them on CCE, improving school infrastructure, ensuring proper PTR and conducting sensitization programmes for the community. Students

want more physical and cultural activities, more projects on mathematics and science and expert teachers in mathematics and science. Parent-teacher meetings should be done more frequently in all the schools where students' views on school activities would be discussed and dealt with. Teachers wish that the state and the district-level knowledge should be made available to them. The administration can facilitate the process by organizing state and district level seminars and consultations on CCE.

#### ***STATE OF ODISHA***

Considering that more than two-thirds of teachers do not accept CCE wholeheartedly, and that more than 80 per cent of teachers feel burdened because of CCE, a major reorientation in teachers' attitude is required. On a first priority basis, a format for easily recording the results of student assessment may be made available to teachers. Students, parents and community members need to be sensitized on the importance and advantages of CCE. Besides leaflets highlighting the of advantages and use of CCE and being displayed in community centers, the SMC and PTA meetings can be used as platforms for creating community awareness. Teachers need to be trained on the use of techniques like rating scale, checklists, projects and anecdotal records particularly for the assessment of personal-social qualities and curricular activities. These two aspects also need to be assessed on a continuous basis formally as well as informally. Teacher training modules should impress upon teachers the need to conduct diagnostic tests and use information from community members and the results of self- and peer-assessment for making a holistic assessment of student learning and progress. Teachers should gradually shift to reporting assessment results by means of 'grades' along with descriptive notes on students' strengths and concerns. The government may consider supplying each student a diary with a section clearly marked for noting down the results of CCE. All teachers must be exposed to in-service training in CCE and be provided academic support through appropriate field-level monitoring. Teachers acknowledge the importance and advantages of CCE but face problems in implementing the scheme

successfully. The advantages of CCE can be realized if the government takes steps to maintain appropriate PTR, improve infrastructure, reduce teachers' non-academic workload, provide on-site monitoring and academic support, sensitize community on CCE and recruit full time trained vocational teachers. The system should ensure that SMC and PTA meetings are conducted at regular intervals with a clear focus on discussing students' learning progress. The assessment results should be discussed at length with guidelines for future course of action being clearly spelt out.

#### ***STATE OF WEST BENGAL***

Compared to the three other states, personal-social qualities are least assessed in West Bengal. Thus teachers need to be oriented to focus on the assessment of personal-social qualities through appropriate training and supervision. The use of assignments, checklists, rating scales, projects and anecdotal records as techniques of student assessment particularly relating to curricular activities and personal-social qualities should be emphasized in teacher training programmes. Though some of them appreciate the advantages of CCE, teachers might be finding it difficult to bring a harmony among techniques, types and areas of assessment. It is state's responsibility to provide them a common and simple format for recording assessment results corresponding to all important components of CCE. Teachers rarely use diagnostic tests and the results of such tests for remediation. If each student is given a diary with columns marked for recording the results of CCE, teachers can note students' strengths and concerns and can use such information on a sustained basis for remediation purposes. Teachers are expected and should be trained to share assessment results with students and their parents. It is not only that the information would be shared with them but also parents and community members can be used as sources for obtaining information for charting out a holistic profile of the student. All teachers must receive in-service training in CCE. For successful CCE implementation, the government should attend to a few issues on priority basis such as ensuring appropriate PTR, training to all teachers, providing learner-friendly infrastructure, reducing teachers' non-academic workload, creating community awareness, instituting a healthy



monitoring mechanism and appointing trained vocational teachers in schools. To make the process of learning and assessment student-friendly, students may be allowed to express their views freely relating to their learning and assessment in a supportive atmosphere created in schools.

### **ADDRESSING THE CCE CONCERNS IN ALL THE FOUR STATES**

Though there are a few specific variations across states, the four states share some common features. Most schools neglect assessment of curricular activities and personal-social qualities. These important components of CCE need to be attended on a priority basis.

Instead of focusing heavily on half-yearly and annual tests conducted in written or oral mode, teachers need to make use of a variety of techniques commensurate with the area being assessed to obtain a holistic profile for a student. There should be shift from awarding marks to awarding grades and narrative analysis of students' strengths, concerns and progress. The tests/ assessments should be built into the teaching learning process and be conducted on a continuous basis.

As parents/community members play a vital role, there should be regular parent-teacher meetings with clear focus on discussing students' learning and progress and charting out future course of action. Art education, vocational education and health check-up are grossly neglected. Special efforts are to be made to overcome the situation. In Odisha and Bihar, 54 to 60 per cent of teachers show favorable attitude towards CCE. This is a healthy trend. The system should take advantage of this cognitive adoption to hit a target of at least 90 per cent. In West Bengal and Jharkhand, only 30 to 35 per cent of teachers have favorable attitude towards CCE. The picture is not very encouraging. One needs to invest intensively and extensively within a time frame to bring about improvement in the situation. Supplementary reading material on CCE with enough examples be prepared and distributed amongst teachers, because many of them feel cognitively isolated from the scheme. Services of teachers who are strongly favorable towards CCE may be used by treating them as the field-level ambassadors and such teachers

may be reinforced appropriately. Experts may be available on-line to respond to queries of teachers on CCE. An easy accessible website on CCE may be opened so that the teachers can take advantage of it. The key resource persons may move to selected pockets inside the state to provide on-site help to teachers on CCE rather confining all learning to only teacher training programmes conducted at the state or the district level. The awareness of the community about the many meaningful facets of CCE can be enhanced by making the Village Education Committee / School Management Committee more vibrant and active.

### REFERENCES

- MHRD (2009) *Right of Children to Free and Compulsory Education Act, 2009*. Govt. of India, New Delhi.
- NCERT (2005) *National Curriculum Framework*. Author, New Delhi.
- Panda, B. N. (2005) *School Based Evaluation Scheme: What Research Advocates*. Regional Institute of Education, Bhubaneswar, Orissa.
- Panda, B. N. (2012) *Examination reform at secondary stage*. Paper presented at the National Seminar on Examination Reform, NEHU, Shillong.
- Panda B. N. (2012) *Status of CCE of Odisha at elementary stage*. Paper presented at National Conference on Assessment, NCERT, New Delhi.
- Panda B. N. (2012) *Status of CCE at Elementary Stage: A Research Report*. Regional Institute of Education, Bhubaneswar.
- Panda B. N. (2013) *Training Package on CCE at Elementary Stage*. Regional Institute of Education, Bhubaneswar.
- Panda B. N. (2014) *Importance of CCE at School stage*. Paper presented in the Training Programme of RMSA, Regional Institute of Education, Bhubaneswar.

## **EDITORIAL BOARD**

Dr. Mohit Mohan Mohanty, 14 Kumar Complex, Kanika VIP Road,  
CUTTACK- 753 008 Odisha

E-mail: mohit.mohanty@gmail.com

Prof. G. C. Nanda, Head, Department of Education, Ravenshaw University,  
Cuttack-753 003 Odisha

E-mail: gcnanda2005@yahoo.co.in

Prof. (Mrs.) M. S. Lalitha, 67, 7th Cross, Gokulam, First Phase, V. V.  
Mohalla, Mysore-570002, Karnataka

E-mail: nandakumarlalitha02@gmail.com

Prof. S. Rajasekar, Head, Dept. of Distance Education, Annamalai  
University, Annamalai University, Annamalai Nagar-608 002 Tamil Nadu

E-mail: drsrajasekar@gmail.com

Dr. D. K. Diwan, House No.200, Vikash Nagar, Rohtak - 124 001 Haryana  
– Associate Editor

E-mail: drdkdiwan@gmail.com

Prof. B. N. Panda, Head, Department of Education, Regional Institute of  
Education, Bhubaneswar-751 022 Odisha -Associate Editor

E-mail: bnpanda38@hotmail.com

Dr. Sunil Behari Mohanty, General Secretary, AIAER, N 1/55 IRC Village,  
Bhubaneswar- 751 015 Odisha - Editor

E-mail: aiaer1987@gmail.com, OR sunilmohanty@gmail.com

**REGISTERED WITH REGISTRAR GENERAL OF NEWSPAPERS OF  
INDIA**

**REGISTRATION NO. 48247/89**

**Printed and published by Dr. Dhruva Charan Mishra, on behalf of**

**All India Association for Educational Research,**

**Printed at Creative Offset, N6/428, Nayapally, Bhubaneswar -15**

**and**

**Published at N 1/55, IRC Village, Bhubaneswar-15**