HEART
HEALTH & EDUCATION ADVICE & RESOURCE TEAM

Helpdesk Report: Universal design of schools and classrooms

Date: 19th July 2013

Query: What evidence exists to support investment in universal design of schools and classrooms? Include studies that look at benefits, costs, and specific elements of universal design (toilets, windows, ramps etc).

Content

1. Overview

Universal design is about access and also creating a more inclusive and learning-friendly environment in school. Schools that are built based on universal design principles will be more effective because they will enable children to learn, develop, and participate, instead of "disable" children by creating barriers to their development and participation. Space, light, materials, and even colour affect the way education is experienced. Schools can make excellent use of these elements in creating buildings and grounds which reflect the needs and desires of their students and staff.

Considerations for universal design in education include:

- Getting to school
- Selecting an accessible school site
- Planning a school site
- Designing and building
- Creating a learning environment
- Hygiene—toilet, shower and sink facilities
- School playground and physical education
- The cost of providing accessible schools for inclusive education

The cost of including access features to a school latrine in Ethiopia was found to be under 3% of the total cost (Jones, 2011). Accessibility incorporated into the design of a school in South Africa was found to be 0.78% of the school's total costs (Metts, 2000).

World Bank (2008) notes that the cost of making adaptations after a building is completed is far greater than providing full access from the outset. It can rise up to 5% or more of total cost depending on the modification of the architectural features of the building. Participation of local stakeholders is critical for cost effective universal design because it helps identify locally available products and construction techniques. The cost of not incorporating universal

design can be significant, taking into account human cost and opportunity cost incurred due to inaccessibility. When buildings are inaccessible, the human cost of having people to provide assistance would be greater. World Bank (2005) provides some strategies for keeping school accessibility costs to a minimum.

Benefits include:

- Universal design of schools will make them easier to maintain because the buildings will have fewer stairs, wider door openings, less obstacles to circulation and more durable walking surfaces.
- Improved lighting and elimination of hazards will lead to fewer accidents.
- Schools are often the largest civic facility in rural villages, therefore, accessible school buildings are likely to increase participation in civic life for all people. This participation may reinforce the value of school attendance and help to ensure that facilities keep their children in classes.
- In case of emergency, school buildings are often used as temporary shelters. Not making them accessible may exclude people with disabilities and others with limited mobility.

Section 4 includes universal design recommendations from outside of the education context.

It was not possible to identify concrete impact studies within the limitations of this report.

2. Universal design in the education context

Teaching Children with Disabilities in Inclusive Settings
Haddad, C. 2009. Embracing Diversity: Toolkit for Creating Inclusive, Learning-Friendly Environments, Specialized Booklet 3. UNESCO Bangkok.
http://www2.unescobkk.org/elib/publications/243_244/Teaching_children.pdf

According to the UN Convention on the Rights of Persons with Disabilities, universal design means the design of products, environments, programmes, and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialised design. “Universal design” shall not exclude assistive devices for particular groups of persons with disabilities where this is needed.

The first thing that meets us in most public buildings is stairs. These must be climbed before we can enter the building. Stairs are often the first barrier for many children and adults to access schools or other public buildings and enjoy the services these facilities have to offer. Sometimes there are just two or three steps; other times, there are many more. Some stairs have hand railings on the side to give support, but most do not.

All public buildings should therefore offer alternative ways to enter. Ramps are in most cases easy and relatively inexpensive to build (at least in 1-story buildings) and will benefit many. Ramps should therefore be added on to all existing schools and other public buildings. When new school buildings are being planned, and designs are being developed, we need to make sure that they are equally accessible for all. Ramps and walkways should be incorporated into the design, in such a way that they do not become separate features for children/ teachers/ parents with disabilities, women who are pregnant, and the elderly, but will present attractive, alternative access-ways for all users.

Space, light, materials, and even colour affect the way we experience education. Schools can make excellent use of these elements in creating buildings and grounds which reflect the needs and desires of their students and staff, but unfortunately, schools are often designed and built without fully considering the needs of the community who uses them.

Universal design is therefore not “just” about access, but also about creating a more inclusive and learning-friendly environment in school. Schools that are built based on universal design principles will therefore be more effective because these schools will enable children to learn, develop, and participate, instead of “disable” children by creating barriers to their development and participation.

Case Study

Thnoeng Sokha from Samlot District in Cambodia has been paraplegic since she was five years old. She never thought she would be able to go to school because she could not walk to school on her own. Her house is 3 km from school and the condition of the road to school was very bad. However, she got two wheelchairs from an international organisation - one is kept at her home and the other is kept at school. The wheelchairs have given Sokha freedom. Her younger sister or friends help to push her to school. At first, she had to cross a stream that didn’t have a bridge. This was especially difficult with all the slip and mud during the rainy season. Now her journey to school is made easier because the community has built a basic wooden bridge to cross that stream and the road to her school has also been repaired.

Her primary school facilities have improved recently because a ramp has been added to improve access to the classrooms. A new toilet block with ramp has also been built. Sokha is much more confident now and hopes to continue her education at lower secondary school. A new secondary school is being built closer to her house – this should be fully accessible according to the new Ministry of Education standards.

(From: Sophal, K. / Fox, S. (2006) “Physical Accessibility & Education,” in EENET Asia Newsletter No. 4, Jakarta, Indonesia: EENET Asia, pp. 14-15 http://unesco.org.pk/education/icfe/resources/res4.pdf)

Further examples:

The design for latrines in schools participating in the WASH (Water, Sanitation and Health Education) programme in Tajikistan is currently being redesigned to ensure improved accessibility for children with disabilities. The new design will make the latrines more user-friendly for all the children in the school as they are more spacious, there will continue to be separate spaces (and entrances) for girls and boys, and the new design will continue to be based on the same low cost philosophy as previous designs.
(From: UNICEF. (2008) “Guidelines for Universal and Energy Efficient Design,” Dushanbe: UNICEF)

A new school building with access ramps, colour coding on walls and doors, colour marking and tactile patterns on the floors was constructed in Lombok (Indonesia). The building was planned and designed by the teachers in the school and the headmaster monitored the construction process to ensure that the work was done according to specifications and remained within the budget, which was developed according to Indonesian government standards for school buildings.
(From: Kaplan, I. (2007) “Inclusive School Design: Lombok, Indonesia,” in EENET Asia Newsletter No. 4, Jakarta, Indonesia: EENET Asia, pp. 18-19 http://www.idp-europe.org/eenet-asia/eenet-asia-4-EN/page18.php)

In the O.B. Montessori School in Manila (Philippines) crafts, and health education is taught in a “Bahay Kubo” a traditional Filipino village house. The traditional environment reduces the barriers to learning and participation for all the children, but especially for children and youth with disabilities and other special educational needs. Because they are taught in a traditional (and familiar) environment children find it easier to link what they learn in school with what they experience at home.
(From: Soliven, P. (2008) “Helping People, Help Themselves” in EENET Asia Newsletter

No. 5. Jakarta: EENET Asia, pp. 8-9
http://www.idp-europe.org/docs/EENET_Asia_5_EN.pdf)

Accessibility Design Guide: Universal design principles for Australia's aid program
A companion volume to Development for All: Towards a disability-inclusive Australian aid program 2009–2014
AusAID, 2013
http://www.addc.org.au/documents/resources/accessibility-design-guide-ausaid-2013_971.pdf

Universal design – means the design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialised design. Universal design does not exclude assistive devices for particular groups of people with disabilities where this is needed. For example, the use of Braille for blind people is still needed, although universal design could be employed to make public signs and symbols to accommodate the majority of the population.

Annex F provides guidance development practitioners can consider when applying universal design principles in the education sector. While based on good practice and successful implementation of universal design, this guide is not meant to be prescriptive. It is based on the reality that the barriers people with disability face vary between developing countries and between locations in-country. It is also based on the reality that development projects are unique and face their own challenges, locally or otherwise, relating to education.

The annex is designed to assist ministries of education to meet the universal design requirements in their national standards for all educational facilities, specifically those relating to providing accessible environments. It is of benefit to principals, teaching staff and others involved in school communities. It is also of benefit to architects, building contractors and others involved in planning the organisation of schools and school grounds to facilitate movement and participation of children with disability.

Schools in this annex refers to pre-schools and daycare facilities, early childhood centres, as well as primary, high and secondary schools (unless otherwise stated).

The annex starts with a general description of how universal design principles support inclusive education through planning and designing new schools and refurbishing existing schools. It then explores what inclusive education is and how universal design principles can be applied in education and provides a list of resources.

Guidelines for consideration are given for the following areas:

- Getting to school
- Selecting an accessible school site
- Planning a school site
- Designing and building
- Creating a learning environment
- Hygiene—toilet, shower and sink facilities
- School playground and physical education
- The cost of providing accessible schools for inclusive education

Centre for Excellence in Universal Design. 7 Principles.
http://www.universaldesign.ie/exploreampdiscover/the7principles

These are not specific to the education context but underpins universal design in all contexts.

The 7 Principles of Universal Design were developed in 1997 by a working group of architects, product designers, engineers and environmental design researchers, led by the late Ronald Mace in the North Carolina State University. The purpose of the Principles is to guide the design of environments, products and communications. According to the Center for Universal Design in NCSU, the Principles "may be applied to evaluate existing designs, guide the design process and educate both designers and consumers about the characteristics of more usable products and environments."

The 7 principles of universal Design:

1. Equitable use
   The design is useful and marketable to people with diverse abilities (people both with and without disabilities). Equal access for all children to schools and school facilities can be implemented with simple and relatively inexpensive solutions.

2. Flexibility in use
   The design accommodates a wide range of individual preferences and abilities.

3. Simple and intuitive use
   Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.

4. Perceptible information
   The design effectively communicates necessary information to the user, regardless of ambient conditions or the user's sensory abilities. It is important that school books are made available in regular ink print as well as in Braille. The ink print should be of good quality and with good contrast colours. A minimum font size of 12 should be used. If books are printed with smaller font sizes, they need to be made available in large print for children with low vision.

5. Tolerance for error
   The design minimizes hazards and the adverse consequences of accidental or unintended actions.

6. Low physical effort
   The design can be used efficiently and comfortably, with a minimum of fatigue.

7. Appropriate size and space
   Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

3. Cost and benefits

Inclusive design of school latrines – how much does it cost and who benefits?
Jones, H. 2011. WEDC.
http://wedc.lboro.ac.uk/resources/briefnotes/BN001_School_Latrines.pdf

Limited data from WaterAid estimates that it costs 8% extra to make a school latrine accessible. Research carried out by WEDC in collaboration with World Vision and WaterAid in Ethiopia found the additional cost of making a school latrine accessible to be under 3% of total costs (Table 1).

Table 1. Costs of inclusive design of school latrines in Ethiopia

Latrine description	Description of access features	Total cost of latrine	Cost of access features*	% cost of accessibility
School A Single block VIP latrine of 8 cubicles (urban) Completed 2009	• Access ramps x 2 • Widened doors x 2 • Support rails for 2 cubicles • Raised toilet seats x 2	£5,663	£169	2.98%
School B Single block dry pit latrine of 8 cubicles (rural) Completed 2010	• Access ramps x 2 • Widened cubicles x 2 • Widened doors x 2 • Support rails for 2 cubicles	£7,122	£179	2.51%
School C Two blocks VIP latrines of 8 cubicles (urban) Completed 2009	• Access ramps x 2 • Widened cubicles x 2 • Widened doors x 2 • Support rails for 2 cubicles • Raised toilet seats x 2	£7,231	£161	2.23%

*Costs have been rounded to the nearest whole GBP

Benefits were identified during primary school visits. Users were asked for their views on the inclusive latrines compared with the conventional latrines. The key benefits they identified were:

- Users on crutches or in wheelchairs could use the latrine more easily and no longer had to go home to use the latrine.
- Blind users found the access ramp enabled them to walk with ease and confidence, and could use their white stick to easily locate the toilet seat.
- Young children could hold the support rails to better aim at the toilet hole.
- School directors concluded that the latrines benefitted all schoolchildren from grade 1 to 8, including disabled children, as they were safer and more secure than the old latrines. They also reduced soiling of the latrine and, since they were popular with the children, reduced open defecation. Some parents have promised to enrol their disabled children in school.

Disability Issues, Trends and Recommendations for the World Bank
Metts, R.L. 2000. World Bank.
http://siteresources.worldbank.org/DISABILITY/Resources/280658-1172606907476/DisabilityIssuesMetts.pdf

This report includes five South African case studies illustrating that accessibility provision can be cost effectively accomplished in a variety of settings.

Case 2: An Accessible Community Centre
East of Cape Town, informal settlements are in the process of being transformed from “townships” into formal urban neighbourhoods. Community centres are being developed to provide multifunctional space for a range of activities from adult education to sports. One of these, the Ikwezi Community Center in Gugulethu was designed to provide nearly complete environmental accessibility (with the single exception of an inaccessible viewing gallery in the Main Hall). The complex consists of a large multipurpose hall with ancillary accommodation, a smaller subdividable hall with adjacent storage space for equipment and furniture, a

gymnasium with sports offices, a small open amphitheater, a computer centre and an administration centre. The complex, completed in 1998, was built with direct community participation by an emerging contractor.

The site is flat, which eliminated the cost of ramping. Accessibility provision included dedicated parking bays, access to all components of the complex (with the one exception mentioned), strong colour contrasts around doors and entrances and other way finding support, teletext facilities and the standard unisex accessible toilet. Limited signage was provided in the complex, as the strong colour contrasts of the buildings were used to orient building users. By applying Universal Design principles in the design of the majority of the project's spaces and facilities, accessibility related expenses were limited to the following costs for an accessible unisex toilet, teletext facilities and articulated paintwork:
Unisex accessible toilet facility R 5,500
Integral teletext equipment R 1,200
Articulated paintwork R 1,600
TOTAL COSTS R 8,300

Though paving slabs created a step into one building in the complex, and though the gallery in the Main Hall was not accessible, the Ikwezi Community centre was largely accessible and had all the facilities necessary to make it an appropriate facility for the full social integration of people with disabilities into the Gugulethu Community. The final cost of construction was R1,768,700, and the cost of providing accessibility was R 8,300. Thus the proportional cost of incorporating accessibility into the project was only 0.47% of the cost of the project.

Case 4: Accessibility Incorporated into the Original Design of a School
The Gamalake Lower Primary School, located on the South Coast of the area now known as the province of KwaZulu Natal, is a standard design format school developed within the framework of the reduced norms and standards introduced by the KwaZulu Government. It consists of twenty four classrooms, an administrative building, one multipurpose classroom and toilet facilities. Accessibility was incorporated into the original design of the school, which was completed in 1997.

The only additional expenditures identified were the costs of an entrance ramp between the parking level and the school, two unisex accessible toilets and larger signage. Under the South African Code 0400 it is possible to reduce the number of toilet fittings by the number of accessible unisex toilet facilities provided in the building. The net cost of an accessible toilet is thus the additional cost of providing the larger separate cubicle, grab rails and other requisite fittings. Since the school had been designed for accessibility from the outset, all access ways, entrances and circulation systems had been ramped and graded appropriately.

The costs of the additional accessibility items were as follows:
Entrance ramp from the parking area R 23,000
Additional cost for unisex accessible toilets R 9,800
Enlarging signage to facilitate way finding R 3,200
TOTAL COST R 36,000

The cost of incorporating accessibility into this school's original design (R 36,000) was only 0.78% of the school's total cost (R 4,603,700).

Design for All: Implications for Bank Operations
Snider, H. & Takeda, N. 2008. World Bank
http://siteresources.worldbank.org/DISABILITY/Resources/Universal_Design.pdf

The major cost incurred in incorporating universal design is the cost to retrofit various features to accommodate specific needs. When managed appropriately, however, this

retrofitting cost can be minimised. Good practices of cost-effective universal design include the early incorporation of universal design and local stakeholder participation in it.

Research has shown that providing full access facilities from the outset has additional costs of approximately one percent. However, the cost of making adaptations after a building is completed is far greater; it can rise up to five percent or more of total cost depending on the modification of the architectural features of the building. For example, universal design is often considered to require much more space to accommodate wheelchairs. Two design research studies showed, however, that redesigning non-accessible buildings required no additional space, but just rearrangement of the existing plan. These findings imply that universal design would not require many additions if introduced before drawing the blue prints of a building.

In addition to the early incorporation of universal design, local stakeholder participation in the designing process is a key to cost effective universal design. Appropriate universal design varies according to local conditions. Best practice in one region is not necessarily workable in another context. For example, in a country where wheelchairs are prevalent and Braille or hearing aids are available, it is straightforward to design the building with ramps specifically graded for the wheelchairs, Braille signage, or induction loops for hearing aids. In a country where these are not readily available, the building would be designed differently because end-users would be less independent without wheelchairs or Braille or hearing aids.

The goal of universal design is to benefit the entire population, not just people with disabilities. Therefore, consultations with a variety of potential users (e.g. elders, caregivers with children, etc.) are crucial in order to maximise usability of Bank-funded facilities, as these people are the most knowledgeable about their own needs. In this process, it is helpful to educate designers, builders and citizens about the purpose and benefits of universal design for the whole community so that they understand its value and work to find good solutions to problems.

Participation of local stakeholders is also critical for cost effective universal design because it helps identify locally available products and construction techniques. With resource restrictions, project designers are required to use local materials or techniques as much as possible to avoid significant cost impacts. This is also an important consideration to ensure that such facilities are maintained by local communities afterwards.

While cost of universal design could remain low with its incorporation from the outset and local participation, the cost of not incorporating universal design can be significant, taking into account human cost and opportunity cost incurred due to inaccessibility. When buildings are inaccessible, the human cost of having people to provide assistance would be greater. When someone does not have easy access, the time and effort of other helping individuals will have to make up the difference of the lack of universal design, although the whole scale of this cost cannot be easily calculated.

Furthermore, cost of inaccessible infrastructure would be sharply increased by eliminating economic opportunity for a number of individuals. Physical barriers reduce the economic and social output of persons with disabilities and elders, and investments in the removal and prevention of architectural and design barriers are increasingly being justified on economic grounds.

The cost of not incorporating universal design could be particularly significant for some types of countries: For example, countries affected by conflicts or natural disasters may have a high prevalence of impairments and disability. Failing to incorporate these people into economic, social, political and cultural activities will guarantee a cycle of poverty for survivors and their families, and prevent vigorous economic and social development in the long run.

In general, universal design of schools will make them easier to maintain because the buildings will have fewer stairs, wider door openings, less obstacles to circulation and more durable walking surfaces. Improved lighting and elimination of hazards will lead to fewer accidents. When there are clear benefits for all users, controversies about cost will give way to creative problem solving and providing the best environment for learning possible.

It is desirable that school buildings be usable for all members of the community since they can provide public space for various community activities. Since schools are probably the largest civic facility in rural villages, many community activities will take place in these buildings. Therefore, accessible school buildings are likely to increase participation in civic life for all people throughout the life cycle. This participation may reinforce the value of school attendance and help to ensure that facilities keep their children in classes. Furthermore, in case of emergency, school buildings are often used as temporary shelters. Not making them accessible may exclude people with disabilities and others with limited mobility.

Education for All: the Cost of Accessibility
Steinfeld, E. 2005. World Bank.
http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2007/03/01/000310607_20070301144941/Rendered/PDF/388640EdNotes1August2005CostOfAccess12.pdf

Many strategies can be used to keep the cost of accessibility at a minimum. For instance, sites where buildings must be raised well above grade to mitigate against flooding should be avoided as should sites so small that a two story building will be required.

When revising existing standard designs to make them accessible, it is important to revise the overall designs and not just add accessibility features. Usually, making the plan of another part of the building more efficient can compensate for the added space needed for wheelchair access. When a ramp is added, a stairway can often be eliminated.

In countries where accessibility is a new idea, changes to customary methods of construction may be needed to provide accessibility. For example toilets may be traditionally located between floor levels in two story schools to make them more accessible to each floor.

Simply relocating the toilet rooms to the first floor eliminates any additional cost to make them accessible. Perhaps the most important reason for unnecessary increased costs is not taking accessibility into consideration from the start of a design project. For example, if a school is on a sloping site and the entrance is at the downhill end, adding a second entrance at the uphill end may make a ramp unnecessary. Or, changing the location of the entrance by moving it to the uphill end may not only eliminate the need for a ramp but also for stairs, thereby saving money overall.

There are, of course, some unavoidable costs for accessibility. For example, Education For All includes the provision of toilets or latrines in all school construction projects. Accessible toilets and latrines have to be large enough for wheelchair use. Although this will require more space than what would be needed for inaccessible facilities, the additional area required is minimal, about one square meter in a toilet stall. This is insignificant in comparison to the costs of adding the toilet or latrine itself.

Guidelines for cost control:
Design factors:

- Use topography to an advantage. Steeper ground often makes it easier to provide access, not harder. Paths oriented parallel to the slope of land are easier to make accessible than those that run perpendicular to the slope.

- Avoid level changes inside the building. This removes the need for ramps entirely. If abrupt level changes are kept below 15 centimetres, railings are not needed on ramps.
- Eliminate raised thresholds and steps at doorways. Thresholds are often used to bridge the gap between different floor surface materials on each side of a wall. When needed, thresholds should be recessed or kept low with a gradual transition from exterior floor surface to interior floor surface. This will eliminate the need for ramps and separate accessible entrances to classrooms.
- Avoid the use of elevators and lifts. They are the most costly items to build and may be very hard to obtain, causing significant construction delays. They also create significant maintenance costs and may take a long time to repair.
- Where no site is available that is large enough for a one-story school building, plan the school using a split level design so that ramps can be used to connect levels. On steep sites, an accessible entry can be provided to each level connected by an accessible path of travel outside. In climates with extensive rainy seasons, it may be possible to shelter the paths with overhanging roofs or galleries.
- Provide increased space for wheelchair access without increasing the overall size of the building by careful design and efficient use of space everywhere.
- Run ramps in the direction of travel so that everyone will use them and stairs can be eliminated. Use topography to an advantage.

Construction factors:

- Avoid specialty products. Find locally available alternatives when costs are prohibitive. For example, make grab bars from steel bars, pipes or wood if it is cheaper.
- Be creative in the use of available materials and products. For example, if wide doors are not available, use double doors made from two narrow doors. Paved surfaces, although desirable, are not absolutely necessary for wheelchair access if walking materials are durable, even, stable and well drained.
- Educate builders about new practices before construction begins to avoid creating problems in the field and institute quality control procedures to ensure things are being built properly. Rebuilding projects that are already under construction increases the cost of accessibility significantly.

Social factors:

- Invest resources in education and outreach during design to engage local builders and product suppliers in identifying how to accomplish the goals of accessibility. This will reduce lack of cooperation and reduce the need for quality control when construction commences.
- Use culturally appropriate means to provide access. For example, trying to save money by building one unisex accessible latrine instead of making the regular boy's and girl's toilet facilities accessible may be unacceptable in a culture that maintains strict separation between the sexes.

How to build an accessible environment in developing countries : Manual #2 - Access to water and sanitation facilities, Part 1 – Toilets and closed showers
David, V. 2008. Handicap International.
http://www.handicap-international.org.uk/Resources/Handicap%20International/PDF%20Documents/HI%20Associations/AccessibleEnvironmentDev2_Part1_2008.pdf

How to build an accessible environment in developing countries: Manual #3 – Free movement
David, V. 2008. Handicap International.

http://www.handicap-international.org.uk/Resources/Handicap%20International/PDF%20Documents/HI%20Associations/AccessibleEnvironmentDev3_2008.pdf

Not specific to schools but some costing in these documents might be useful for reference.

The State of the World's Children 2013. Children with Disabilities.
UNICEF. 2013.
http://www.unicef.org/sowc2013/files/SWCR2013_ENG_Lo_res_24_Apr_2013.pdf

The cost of integrating accessibility into new buildings and infrastructure can be negligible, amounting to less than 1 per cent of the capital development cost. However, the cost of making adaptations to completed buildings can be much higher, especially for smaller buildings, where it can reach 20 per cent of the original cost. It makes sense to integrate accessibility considerations into projects at the early stages of the design process. Accessibility should also be a consideration when funding development projects.

World Disasters Report
Klynman, Y., Kouppari, N., & Mukhier, M. 2007. International Federation of Red Cross and Red Crescent Societies.
http://www.ifrc.org/Global/Publications/disasters/WDR/WDR2007-English.pdf

An important application for universal design is to provide for emergency evacuations from buildings. Experience from major disasters has shown that people with disabilities are often left behind.

Reaching the Unreached. Bridging the social divide in Cambodia through inclusive education.
Vantha, C. 2010. VSO International.
http://www.vsointernational.org/Images/reaching-the-unreached-inclusive-education-cambodia_tcm76-32441.pdf

The VSO Mainstreaming Inclusive Education Project in Cambodia had inclusion of children with disabilities as part of the focus. The project supported the funding of small grants to enable volunteers to provide, among other things, the building of access ramps and functioning toilets. The overall project was evaluated as successful. Enrolment and promotion rates of children with disabilities increased.

4. Universal design recommendations/guidelines

Water and sanitation for disabled people and other vulnerable groups: Designing services to improve accessibility. Chapter 7: Toilets access and use
Jones, H. & Reed, B. 2005. WEDC Loughborough, UK.
http://wedc.lboro.ac.uk/resources/books/Water_and_Sanitation_for_Disabled_People_-_Ch_07.pdf

This section considers a wide range of toilet facilities and their alternatives, from sanitary water flush systems to open defecation which may be applicable to school design.

Promoting Universal Access to the Built Environment. Guidelines.
Christian Blind Mission, 2005
http://www.unicef.org/french/education/files/CBM-AccessibilityManual.pdf

This publication provides guidance for improving access to the built environment for people with disabilities and reducing barriers. The publication includes information on the concept and ways of implementing accessibility and inclusive design as well as technical recommendations and good practises for the planning and design of accessible buildings and facilities. It targets architects, planners, policy makers, government officials and NGOs, decision makers in the construction sector and people with disabilities to enable them to promote and improve architectural accessibility throughout the world.

Guidance is included on:

- Anthropometrics and measures of assistive devices
- Visual accessibility
- Vertical accessibility
- Horizontal accessibility

World Report on Disability
WHO, 2011
http://www.who.int/disabilities/world_report/2011/report.pdf

The World Report on Disability suggests steps for all stakeholders – including governments, civil society organizations and disabled people's organisations – to create enabling environments, develop rehabilitation and support services, ensure adequate social protection, create inclusive policies and programmes, and enforce new and existing standards and legislation, to the benefit of people with disabilities and the wider community. People with disabilities should be central to these endeavors.

This report includes some universal design examples and recommendations from outside of school settings.

5. Additional information

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