CHANGING THE GAME

Outcome Evaluation Report

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QUEST ALLIANCE

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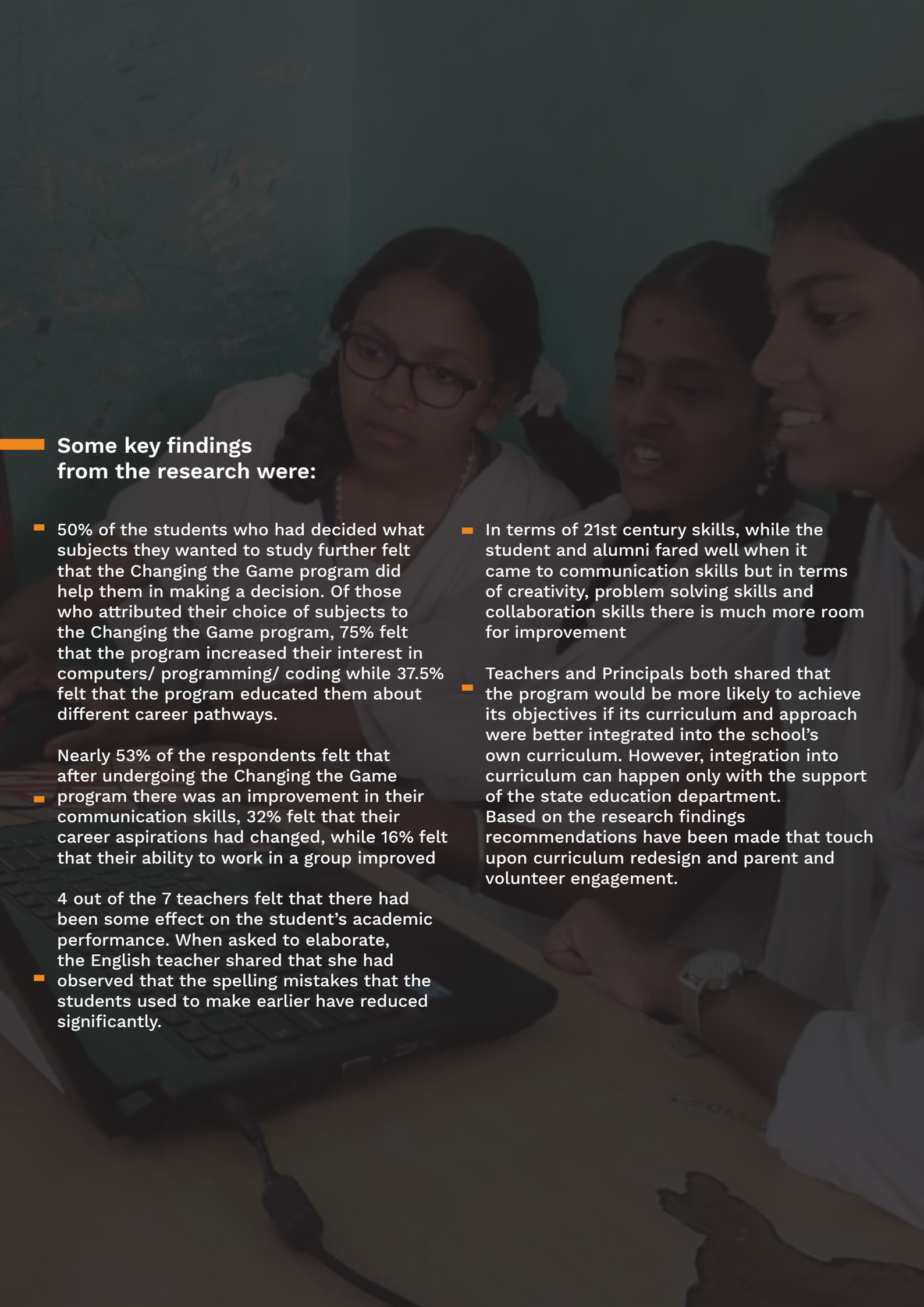
Executive Summary

Quest Alliance is a not for profit trust that equips young people with 21st century skills by enabling self learning. AMD Foundation connects and empowers individuals with knowledge, thereby opening doors to opportunity. The Foundation's signature program, AMD Changing the Game, supports initiatives designed to help youth harness the power of digital games with social content, while learning critical education Science, Technology, Engineering and Math (STEM) skills and life skills.

In 2015 Quest Alliance and The AMD Foundation joined hands to provide government school students in Bangalore and Hyderabad the opportunity to build critical 21st century skills such as programming, problem solving and technology career exploration.
To examine and document how far the program had been able to achieve its objective, a research study was conducted centred on one school (ZPHS Kukatpally) in Hyderabad where the program was implemented continuously over the period of 4+ years. The study involved in-depth interviews.



Some key findings from the research were:

- 50% of the students who had decided what subjects they wanted to study further felt that the Changing the Game program did help them in making a decision. Of those who attributed their choice of subjects to the Changing the Game program, 75% felt that the program increased their interest in computers/ programming/ coding while 37.5% felt that the program educated them about different career pathways.

- Nearly 53% of the respondents felt that after undergoing the Changing the Game program there was an improvement in their communication skills, 32% felt that their career aspirations had changed, while 16% felt that their ability to work in a group improved

- 4 out of the 7 teachers felt that there had been some effect on the student's academic performance. When asked to elaborate, the English teacher shared that she had observed that the spelling mistakes that the students used to make earlier have reduced significantly.

- In terms of 21st century skills, while the student and alumni fared well when it came to communication skills but in terms of creativity, problem solving skills and collaboration skills there is much more room for improvement

- Teachers and Principals both shared that the program would be more likely to achieve its objectives if its curriculum and approach were better integrated into the school's own curriculum. However, integration into curriculum can happen only with the support of the state education department.
Based on the research findings recommendations have been made that touch upon curriculum redesign and parent and volunteer engagement.

Background

About Public School Education in India

Education in India is provided by both public and private schools. Public schools are mainly governed by Central and state governments. Under Right to Education(RTE), free and compulsory education is provided as a fundamental right to children between the ages of 6 and 14. In terms of attainment rate of primary and secondary education, India has made significant progress. As per the Annual state of education report(ASER) 2012, 96.5% of all rural children between the ages of 6-14 were enrolled in school. What is significant is that an average enrollment of 95% is maintained and it is evident from the finding of ASER 2018, which mentions that the number of students in the age group 6-14 who are not enrolled in school has come down to 2.8% in the academic year 2018. Overall, around 65.2% of all school students in India go to government schools. These include schools run by the state and local government as well as the central government.

In 1950-51, there were about 210 thousand primary and 14 thousand upper primary schools. Their numbers are now increased to 627 thousand and 190 thousand respectively as in the year 1998-99; thus showing an average annual growth of 2.30 and 5.58 per cent per annum. As many as 83 per cent of the total 1,061 thousand habitations have access to primary schooling facilities within 1 km and 76 per cent habitations to upper primary schooling facilities within a distance of 3 km. [1]

Like other levels of school education, a significant progress has been made in the sphere of secondary education as well. More than 84 per cent habitations had secondary school/section within a distance of 8 km as compared to 70 per cent within 5 km. During 1950-51 to 1999-2000, the number of secondary and higher secondary schools increased from 7 thousand to 117 thousand. The increase (16 times) is much more rapid than the corresponding increase in the primary (3 times) and upper primary (14 times) schools. By definition, secondary education in India covers children aged 14 to 18, a group comprising 8.85 crore children according to the 2001 Census of India and there are 1,31,827 such schools.[2]

[1] MHRD (2001): Selected Educational Statistics: 1999-2000. New Delhi: Government of India

[2] Mehta, Arun C. (2002): Education for All in India with focus on Elementary Education: Current Status, Recent Initiatives and future Prospects. NIEPA Occasional Papers, No. 30, New Delhi

In India, all efforts in the past were focused on achieving the goal of universal elementary education,however in the recent past there has been a focus on the upper primary and secondary level of education. Most of the secondary schools have school buildings but only 65 percent of them have pucca (permanent) buildings. Government schools had a lower percentage of buildings than the schools under the private managements. Only 75 per cent schools owned buildings and 65 percent needed additional instructional rooms. A large number of secondary schools do not have other facilities like urinals, drinking water and lavatory in schools. Compared to other levels, enrolment at the secondary & higher secondary level had a low enrolment base. In 1950-51, the total enrolment in these classes was only 1.5 million of which girls constituted 13.33 per cent or 0.2 million in the absolute terms. This has increased to 38.99 per cent in 1999-2000; thus indicating that a large number of girls are still out of the system. At the first look, one may say that the girls' enrolment has increased at a much faster rate than the increase in boys' enrolment,however that could only be attributed to the low annual base in the initial period.

Keeping the above realities in mind, it is very evident that:

- Girl students are left behind both in terms of enrolment rate and quality education
- A major chunk of school going students go to the government run schools
- So, it is then important to understand that if one has to create an impact at scale, the natural pathway is to work with the government schooling system and complement it with adequate infrastructure and educational quality

Information and Communication Technology (ICT) In Education

The journey of Information and Communication Technology in Indian school education started through National Policy on Education in India in the year 1984-1986, modified in 1992, stressing the need to include technology in school education to improve the quality of education. This policy led to two central schemes for ICT and Education in 2004, revised in 2010, focusing mostly on computer literacy and Computer Aided Learning. In 2012, the ICT policy in School Education came into existence with the mission of developing, accelerating, supporting and sustaining ICT and ICT-enabled activities and processes to improve access, quality and efficiency in the school system. Over time, the emphasis of ICT in education schemes and policy progressed from computer literacy to making ICT connected to school subjects to improve learning. However, the ground reality is that the use, role and relationship of ICT with quality learning remains elusive. OECD report (2015) challenged the value of ICT in influencing learning in the classroom. Infodev (2010) reported that, while in India and other South Asia countries the interest to employ ICT tools and devices in schools is high, its actual use is low [3].

[3] Charania, Amina(2019): ICT in Education: Indicators for Meaningful Integration in Government Schools, Learning Curve

Challenge in terms of infrastructure availability is high in government schools in India; the erratic supply of power and connectivity issues further act as a deterrent in rural areas.It has been found that only 13 percent government primary and 27 percent upper primary schools have computer facility, in it around 60 percent are secondary schools [4].

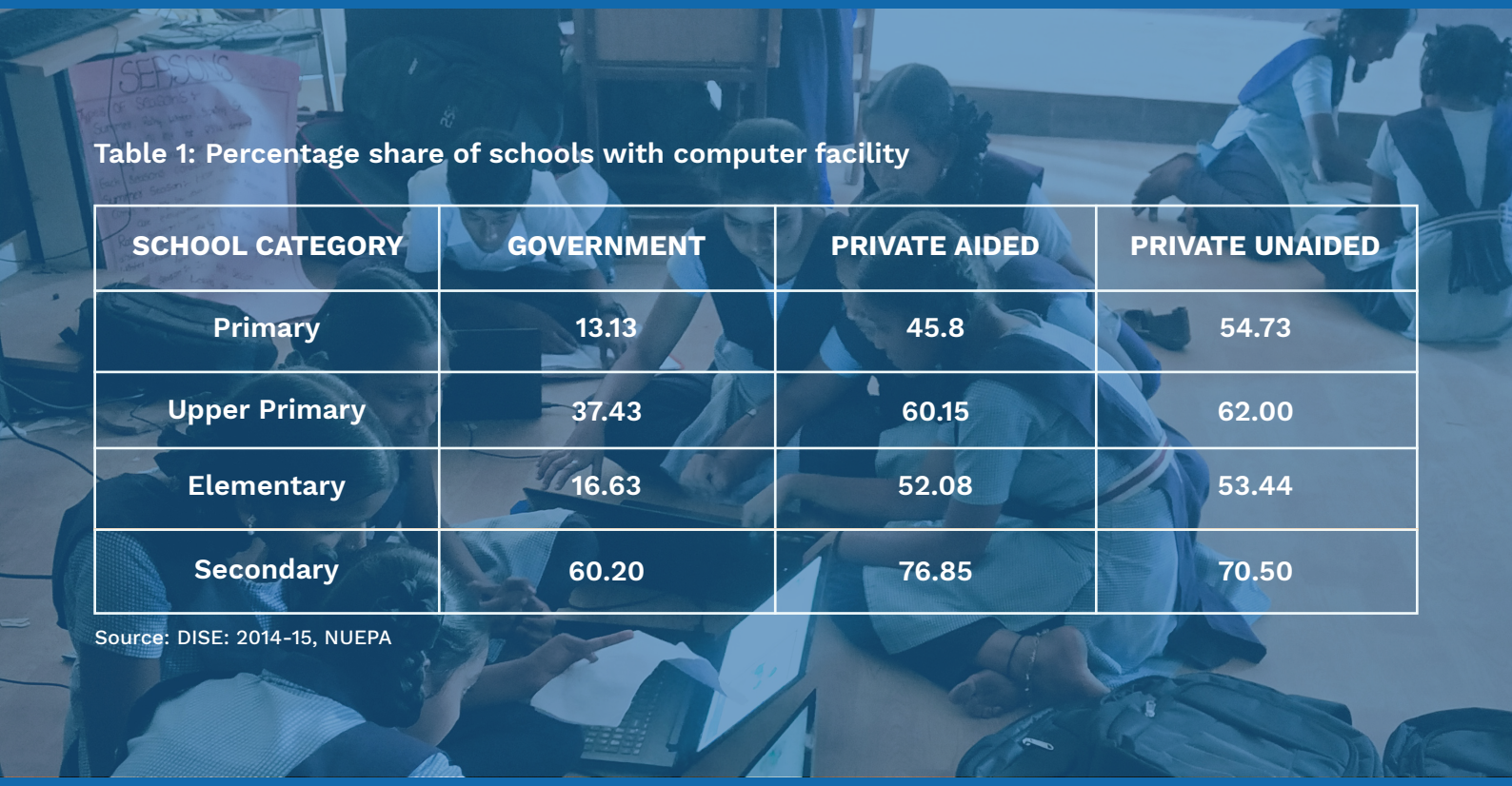


Table 1: Percentage share of schools with computer facility

SCHOOL CATEGORY	GOVERNMENT	PRIVATE AIDED	PRIVATE UNAIDED
Primary	13.13	45.8	54.73
Upper Primary	37.43	60.15	62.00
Elementary	16.63	52.08	53.44
Secondary	60.20	76.85	70.50

Source: DISE: 2014-15, NUEPA

Since 2014, there has been an upsurge in the use of ICT in the form of smart classrooms, where packaged multimedia and lesson plans are delivered, mostly by vendors, for teachers to use in the classroom. These are mapped to textbook chapters and aimed at aiding teachers to deliver their lessons with media-rich resources. This type of teacher centric content delivery packaged for classroom use is also sometimes called 'Smart classrooms'. Here again, one needs to think in terms of who is constructing knowledge, it is very clear that the ICT tools are in the hands of teachers but not students.

There are initiatives like Karnataka Open Education Resources (KOER), started much earlier (in 2013), where subject teachers mainly Mathematics and Sciences teachers make and upload teaching resources, OER has only recently become the new buzz word in government schools across states Free, but not necessarily Open (anyone can legally and freely copy, use, adapt and re-share them, UNESCO), many video-based tutorials have mushroomed and claim to contribute in improving conceptual understanding through the power of digital media, potentially replacing tuition classes.

[4] Bandhopadhyay, Dr. Madhumita: Present Status of Infrastructure Facilities in Schools in India:From National and State Level Perspective, NIEPA, New Delhi

There are national platforms like e-pathshala, Diksha and the National Teacher Platform. Using these as workshop tools for teachers has rapidly become very popular. OERs can vary from offering tutorial kind of videos for better remembering and understanding with some quiz like questions (lower order learning goals) to higher order thinking skills. Most of these are very rarely designed to foster student agency.

ICT in education can be imagined in much more empowering ways and in this light a programme worth mentioning is the Integrated approach to Technology in Education (ITE) by Tata Trust, which was started in 2012. What sets ITE apart from OER and Computer Assisted Learning(CAL) is that it focuses on students' creating a learning artefact and teachers themselves designing the learning activities integrating ICT. Students use ICT tools and applications for seeking information as well as to construct and organise their learning and represent it through computer applications. This project based learning allows them to use and adapt the learning within the local context. Few examples of students' creation are using **SCRATCH**[5] (a visual programming language) to create weather charts for deeper and connected learning for the chapter on weather and climate, a video on sound pollution in environmental science by collecting sound pollution clips from their own environment, a diet chart to compare and relate calorie intake and BMI of their classmates, a road-crossing game and many other relevant topics. This approach has become popular over the years, as it is fun and interesting for students to engage deeply with the subject concepts in the textbook, allowing expression of creativity, local context and language. Even students in tribal areas use local dialects and integrate it with the State language.

Digital applications(like SCRATCH) can be used by students to create their own learning resources. **Seymour Papert** [6] popularized the idea of 'constructionism' in which learners can use digital tools to 'create, learn' and 'learn and create', which is a virtuous cycle of freely exploring digital applications to develop learning materials and through this process learn, both about the use of the digital tools, and the processes of material development.

- **In light of the above, it is important to reflect around the following focus areas:**

- **Learning Design:**

  Type of learning: Is the learning with ICT targeted or limited towards remembering the content, remedial practice or is it aiming for deep learning, higher computational thinking, authentic learning (making learning personal or relevant to real life or connected learning needed to make global connect and higher potential for communication?)

- **Role of the student:**

  Are students mere recipients of the digital content or creators as well? Is technology in their hands and are they actively engaging with it? Are they merely responding to the digital media and content or creating their own learning material?

[5] https://scratch.mit.edu/

[6] An interesting read is: Edith Ackermann. Piaget's Constructivism, Papert's Constructionism: What's the difference? https://bit.ly/1J22OjJ. The NCERT ICT Curriculum also emphasizes that ICTs can be used by teachers and students to 'create and learn.

It is quite clear that there is an immediate and dire need to build agency amongst the students, where they are equipped with skills of a creator mindset, which not only consumes but also builds and for that it is important to understand what has changed in the last centuries in terms of skills needed and how education can play a pivotal role in bridging the gaps.

The role of 21st Century Skills in Education

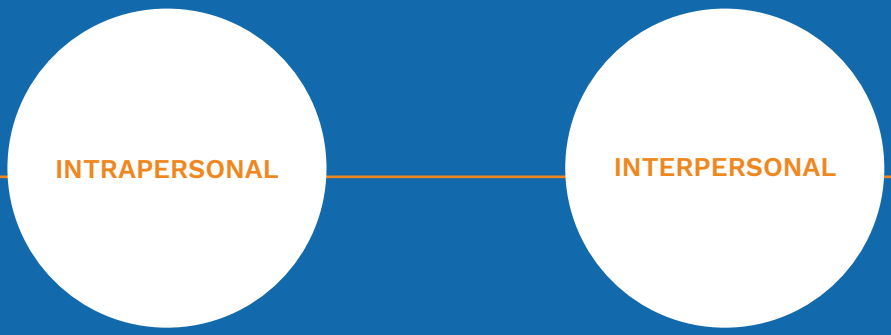
We are living in a world that is changing at a pace never before seen in human history. It is estimated that 65% of children starting school today will hold jobs that do not exist yet. These children are likely to have four or five careers over the course of their working life, and will need to be lifelong learners in order to adapt.

Over the years, it has been found that classrooms today cannot always keep pace with the changing world–especially with the ever-changing technological landscape that redefines future opportunities and skill sets required for young people to thrive. Not only are classrooms, teachers and education systems ill-equipped to address these emergent challenges, students are not receiving the basic education they need to lead a life of dignity and agency. While the government has taken initiatives, however they are not broad-based enough to adequately prepare for the technology led-disruptions to the future of work.

Emerging technologies can create new higher-value jobs that would amalgamate machine capacities and human skills. A case in point would be the increased demand for cybersecurity professionals with the proliferation of IoT or the entire narrative around data and its relevance in every aspect of our lives.[7]

For a school going student, learning and Innovation skills will matter a lot. These skills are needed to develop the student for the time that has not yet arrived. Apart from traditional knowledge, they must be ready for making decisions, analysing the situations, making career choices, collecting and synthesising information, etc. and that too parallelly. In light of this, it is very important to understand the role of 21st century skills in the daily life of our students.

At Quest Alliance, 21st Century skills is being envisaged at two levels:



[7] The Future of work and learning, Quest Alliance, 2019

INTRAPERSONAL

Self Awareness

The ability of an individual to reflect on self and understand their motivations, beliefs, biases, value systems, emotions and multiple dimensions of their identities with a focus on gender and building a digital identity.

Critical Thinking and Problem Solving

Ability to locate, analyse and synthesise information, identify problems, take informed decisions, ask questions to challenge existing norms especially around gender and move towards finding a solution and triggering change. Data analysis from a different perspective and analysing it to come out to a unique solution for a problem is the need of the future and so the skill becomes quite important for the 21st century.

INTERPERSONAL

Communication

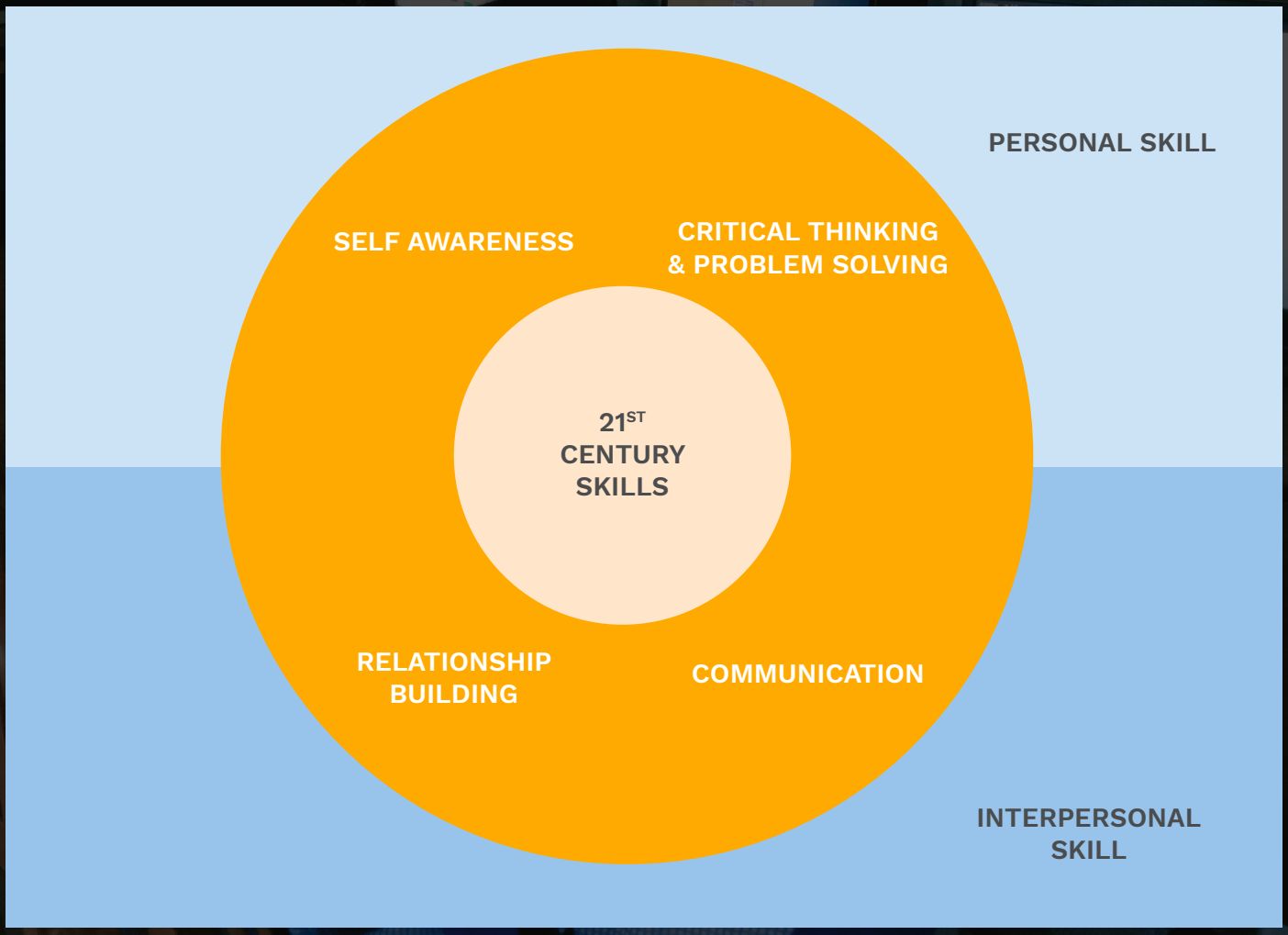
The ability to articulate oneself clearly without fear of any kind, using different mediums including digital and nondigital, and comprehend, listen to the other to respond with compassion and sensitivity. In the 21st century media literacy which includes communication through social media has also become an important skill.

Relationship Building

Ability to collaborate and build enabling relationships by demonstrating empathy and respect for diversity, being adaptable, negotiating for conflict resolution, taking responsibility for one's actions and setting realistic expectations

Diving deeper into these interpersonal and intrapersonal skills, it is quite evident that Digital fluency is going to be central to socio-economic life in the 21st century.[8] It also enables participation in social networks for the creation and sharing of knowledge. While, basic digital literacy will increasingly be a core foundational skill. However, the rapid pace of technological development and deployment will make digital fluency crucial for life-long and self- learning. In view, it is important to realise that our school going children should be exposed to such initiatives which not only promotes digital literacy but also creates pathways to digital fluency, where they are not only consuming but also building digital artefacts.

[8] UNESCO (2011). Digital Literacy in Education Policy Brief, UNESCO Institute for Information Technologies in Education


PERSONAL SKILL
SELF AWARENESS
CRITICAL THINKING
& PROBLEM SOLVING
21ST
CENTURY
SKILLS
RELATIONSHIP
BUILDING
COMMUNICATION
INTERPERSONAL
SKILL

Program History

Evident from some of the sections above, it is quite clear that we are faced with:

- A globalized, technology-driven world that comes with new pressures and expectations. To thrive, students and teachers need to cultivate skills and attitudes that can meet these 21st century challenges.
- An acute need to integrate innovative teaching and learning solutions amongst the more underserved communities and education systems in India, particularly the vast Government-run school that cater to a similar student profile.

> **AMD Change the Game, the signature education initiative of the AMD Foundation, is designed to take gaming beyond entertainment and inspire youth to learn critical education and life skills by equipping them to create digital games with social content. The program's purpose is to promote the use of youth game development as a tool to inspire learning, improve science, technology, education and math (STEM) skills, and spur career interest in game development or a similar field. The initiative is rooted in AMD's commitment to and experience in supporting education and the company's passion and expertise in the graphics processor and gaming industries.**

AMD and Quest Alliance collaborated in 2015 to address the issue by working with government schools in Bangalore and Hyderabad to provide government school students the opportunity to build critical 21st century skills such as programming, problem solving and technology career exploration.

Through training in basic digital literacy concepts and introduction to programming, the objective of the program was to:

- Build computational thinking in students in order to foster 21st century skills, which in turn enables self-learning
- Build school capacity by enhancing the IT literacy curriculum
- Create space for meaningful and value-adding volunteering opportunity for AMD employees

The first year was dedicated to develop, build, test and refine a learning model that can be effectively scaled and operated sustainably in future years with ample opportunity for AMD employees to participate in the in school program with QUEST field staff facilitating their orientation and engagement.

Curricular Approach

The curriculum for **"Changing the Game"** was designed with the following approach to its sessions. There were 4 components to it

EXPLORE	EXPERIMENT	CREATE	SHARE
Students understand: ▪ Themselves: By engaging in a process of thinking about self and articulating that ▪ SCRATCH as a platform: By getting introduced to SCRATCH and its basics ▪ Career opportunities: By understanding what a career means and its different aspects.	Students start to try the different functionality of SCRATCH, go out and do their own research to understand careers better.	Students independently create their own projects, assimilating all the information they have collected about careers.	Students participate in share out events where they present their work to the teachers, other students and their parents.

Curriculum framework

The curriculum for the program was revised after the initial first year of implementation. The details of the curriculum framework is provided in the table below:

PHASE 1 (2015 - 2016)	PHASE 2 (2016 - 2020)
The main objective was to focus on 3 elements that will build 21st-century skills among government school students. These 3 elements were: **UNDERSTANDING SELF** Engage students in a process of self-exploration to identify their interest areas and the skills required for it, connection with subjects being studied, possibilities within the interest areas in terms of its connection with careers. **BUILDING ESSENTIAL SKILLS & COMFORT WITH TECHNOLOGY** While exploring their interests and going through the game design process, the student's skills in the following should be developed - Independent expression - Problem-solving and decision making - Logical and critical thinking skills - Continuous enquiry - Teamwork and collaboration **ENHANCE LANGUAGE COMPETENCY** Build language skills of listening, speaking, reading and writing by providing exposure to more text and creating opportunities for articulating and documenting their ideas and experience These 3 elements spanned approximately 20 hours of classroom instruction. Students additionally used the lab learning SCRATCH and building familiarity with computers and coding.	The curriculum was revised to introduce Self-learning toolkit, student workbooks, and facilitator-led sessions in vernacular language. Curriculum was divided into modules each containing multiple lessons. The duration of each lesson was about 30 mins of classroom instruction/ practice sessions. The modules were delivered via a mix of classroom sessions, computer-based sessions & complimentary worksheets i.e 13 Computer-Based Lessons & 9 Classroom Based Lessons - Module 1: About introduction to SCRATCH and make the children feel comfortable with facilitator - Module 2: About Sequencing & looping programming concepts along with the self assessments,and SCRATCH projects - Module 3: Events and parallelism along with the self assessments, and SCRATCH project - Module 4: About creating basic games on SCRATCH - Module 5: About creating story making projects

Learning outcome evaluation	Learning outcome evaluation
A baseline and end line assessment was done at the beginning and end of the academic year to gauge students' grasp of the concepts that were covered in the classroom.	The baseline and Endline assessment tests were updated to reflect the revision in the curriculum framework. In addition, select students got the opportunity to present their projects in front of a jury panel composed of Quest team members and AMD volunteers. The panel evaluated the selected projects based on the Evaluation Rubrics (details are provided in Annexure 2).

AMD Volunteer Program

The volunteer engagement plan was designed with the following objectives:

- Enhance the understanding of students about careers in IT by having them interact with members of AMD team
- Provide relatable role models to students in Government schools who may be first generation learners in their families
- Give students opportunities to learn in a fun and engaging manner - thus showing that learning isn't limited to the classroom or the lab

Between 2015 and 2019, volunteers participated in at least 2 events per year. The volunteers were encouraged to spend up to 2 hours during each visit with the students and talk to them about careers in tech, SCRATCH programming, future job opportunities etc.

Volunteers were also invited to be a part of the Share Out event. On that day, children presented their projects to the AMD volunteer panel and school representatives. Panel gave critical and empowering feedback to the children on their projects. Students were felicitated with certificates and gifts.

- **Students also got the opportunity to visit AMD's campus in Hyderabad and Bangalore and participate in the Game event.**

About the Study

Quest Alliance has been working in **ZPHS (Zilla Parishad High School) Kukatpally school** since 2015 and the school has been the site of the most sustained implementation of the Changing the Game program. The support from the school authorities and the faculty has been encouraging. The study was done to understand the changes (if any) the program had on different stakeholders who were affected by the program. Additionally, the study also hoped to provide critical insights to the program team for the improvement of the program.

We began the study by defining our key research questions which were:

- What has Quest Alliance learned about the process of implementing the AMD intervention for four years at Kukatpally school?
- Do the students in Kukatpally school demonstrate 21st century skills? If yes, how?
- How has the Changing the Game program affected the students, teachers, and the community in Kukatpally Govt School over the past four years?

Our approach to gather data included:

Identifying different stakeholders	Using various data sources such as baseline and endline data	Artefacts such as annual reports, student' SCRATCH projects over the four year period

Quest Alliance's program officer who has been a part of the Changing the Game program for since the beginning of the program was consulted to help identify respondents for stakeholder interviews. Purposive sampling methodology was used and respondents were selected on the basis of their direct or indirect participation in the Changing the Game program.

Plans to interview parents of students who had undergone the program were shelved because of the difficulty in arranging interviews with the parents within the limited span of time.

Tools were designed and a small pilot test of the tool for student interviews was done with a few students in Bangalore first. Interview tools are available as Annexure 1.

Interviews Conducted:

SR. NO.	RESPONDENT CATEGORY	TOTAL COUNT	MALE RESPONDENTS	FEMALE RESPONDENTS
1	Student	19	9	10
2	Teacher	7	3	4
3	Principal	2	2	0
4	AMD Volunteers	4	2	2
TOTAL INTERVIEWS		32	16	16

Research Findings

- **Research Question 1: What has Quest Alliance learned about the process of implementing the AMD intervention for 4 years at Kukatpally school?**

ZPHS Kukatpally is a co-educational school that was established in the year 1950. The school has students from grade 6-10th and has 25 teachers on its roll. The average enrolment of students in grades 8th and 9th in an academic year is 400 with an almost equal distribution of male and female students. Since 2015-March 2020, Changing the Game program has reached out to approximately 1200 students.

Quest team's experience of program implementation so far:

- The program has created an opportunity for many students to get hands-on experience of working with computers and overcome the fear of using them. The baseline and end-line surveys for the AMD Changing the Game program show that the number of students comfortable with computers increased significantly.
- However, not all students showed equal interest to work on computers or SCRATCH. Students always showed interest to learn beyond the SCRATCH like movie making, MS Office, and playing advanced games. The curriculum can be diversified to generate greater participation amongst students.

- As per the Monitoring & Evaluation tools, including students projects, students have been able to apply the knowledge gained via the program. However, familiarity with the theoretical framework and terminology is relatively poor. The student assessment tools need to be updated to reflect this, where student learning outcomes focus on the ability of the students' to apply their knowledge in different contexts.

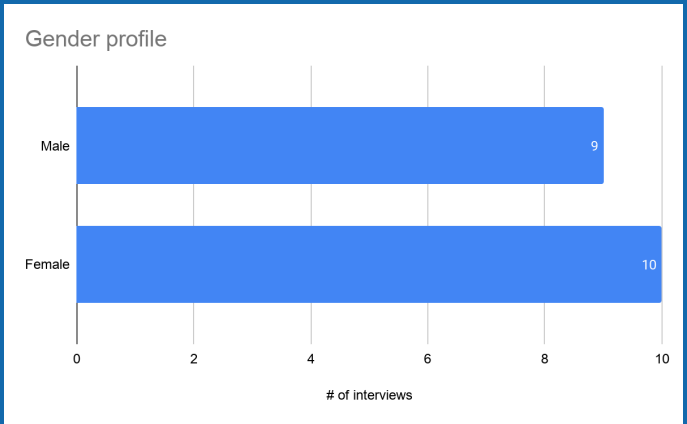
- School management was very supportive for the implementation of this program in their school, and the computer lab was used for the school related things. The school has given a lot of space to hold events even on non working days. In the past year new teachers have been appointed at the school, an orientation was held for them to introduce them to the program and also seek their cooperation. The team reports that the orientation was successful in meeting its objectives and that the teachers were more welcoming post the orientation.

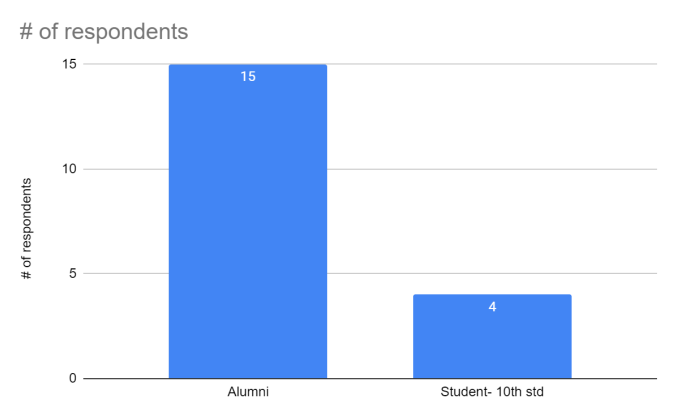
- Beyond the curriculum on coding, modules on gender, life skills, and career skills were also taught in the classrooms. These were well received by the students.

- **Research Question 2: How has the My Code program affected the students, teachers, and the community in Kukatpally Govt School over the past four years?**

STUDENTS

Respondent profile: A total of 19 in-depth interviews were carried out with students who were currently studying in Class Xth at Kukatpally school and those who had graduated from the school in the previous years. The graphs below provide information about the profile of the respondents.





The average age of the alumni respondents was **19 for male and 18 for female.** Respondents who were in 10th standard were 16 years of age and were all female.

The responses from the student respondents have been divided into two sections:
Their impressions about the Changing the Game program and about what influence the program had on them. Analysis of the responses have been organised into two sections accordingly.

About the Program

Impact on students

ABOUT THE PROGRAM:

Describing the Changing the Game program

We asked students to describe the Changing the Game program in their own words to a friend who had no prior information. While most of the students referred to program elements such as making videos and games / animations (79% of respondents), 32% of the students spoke about objectives of the program being increase in confidence, creativity, communication and logical thinking.

53% of the students felt that the program taught students how to operate computers/ learn how to type, about 16% of the students spoke about how the program armed students with knowledge to prepare them for the future.

"In this program we learn about a software SCRATCH. This software we can use to make stories, animations, games etc. You can make all these things on your own."

"The Program is all about enabling creativity in students. In this program we used to develop stories and games. We learn about computers."

Recalling elements from the program

As a follow up question, students were then asked to recall what they remembered about the program. 63% of the students mentioned SCRATCH while 16% of the students mentioned the experience of working in groups. Another 16% spoke about the sessions on career and their future that they had as a part of the program.

Nearly 85% of the respondents could recall their SCRATCH projects. Of these 85%, 80% could describe their SCRATCH projects in detail. Amongst alumni students, 11 out of the 15 students could describe their SCRATCH projects, years after completing the projects.

When asked to talk about the experience of making their SCRATCH projects, nearly 53% of the students spoke about teamwork and another 13% spoke about the experience of addressing and resolving conflict amongst team members. Other responses included: improvement in creativity, appreciation from teachers and fellow students, weaving family and self into a story using SCRATCH, feeling inspired to do better next time etc.

"When I was making the project, since I was the most active person in the lab, everyone was asking me why I made that friendship story. I told them that I want to give a message through this story."

"Through the project we were expressing our feelings. Also during this project we also came across a few incidents where we quarrelled and then the team tried to resolve it. How to overcome ego issues, we understood here a bit."

"I started with a line but as the time passed, my creativity was increasing gradually. The story became interesting."

- **Interaction with AMD volunteers and experience of participating in share out events**

Of the 19 respondents, 8 had participated in a share out event or visited AMD campus, Quest 2 Learn summit. 6 of the respondents could recall interacting with AMD volunteers either at their school or during the visit to AMD campus. Respondents felt that the interaction was very useful because the volunteers resolved their problem (related to the project they were working on), gave them career advice and motivated them.

"It was an awesome experience. I interacted with many educated people. They inspired me a lot. Their standard was different and I wanted to be like them. The project that I made, I presented it in front of many people. I was not nervous in Bangalore because prior to that event the AMD team visited us and they boosted me up. So it all went well with excitement."

"It was great learning while interacting with them (AMD Volunteers).. They resolved my problems related to the project that I was working on."

- **Feedback about curriculum and student workbooks**

More than 60% of the respondents found the student workbooks useful, with 32% of the students saying that the workbooks were easy to understand and another 10% saying that the content was interesting.

"What we have learnt in the SCRATCH program, everything is in that book. Before any class, I used to go through the book and it became easy. If the facilitator forgot any points, we used to find it in the workbook."

"Even if the facilitator is not there or busy with some other student, I can read the book and proceed with my project"

Most of the students felt that the curriculum was manageable along with their studies and they did not feel pressured or stressed.

We asked the respondents to rate the program on a scale of 1 to 10 (keeping in mind the usefulness and interest the program generated amongst them). The program was given an average score of 8.6, male students gave a slightly higher average score of 8.8 while female respondents provided a score of 8.4. Most of the respondents found the program interesting and they appreciated the opportunity to learn computers, which they would not have gotten elsewhere. Some students however felt that the program could have included more modules on coding, MS office and the number of sessions per week could also have been increased.

IMPACT ON STUDENTS:

Career Aspirations

We asked the respondents whether they knew what they wanted to study further, nearly 85% of the respondents were sure of what they wanted to study further. The other respondents weren't interested in studying further but some of them had the desire to be self-employed/entrepreneurs.

Of those who were keen on higher studies, 50% were keen on pursuing a career in engineering (BTech/ MTech) and graphic design. Another 12.5% were keen on pursuing a career in medicine. A much **higher percentage of female respondents (70%)** expressed an interest in pursuing careers in STEM including engineering and medicine as opposed to male students (30%).

We asked respondents whether they felt that Changing the Game program had a role to play in their choice of subjects for higher subjects. 50% of the students who had decided what subjects they wanted to study further felt that the Changing the Game program did help them in making a decision. Of those who attributed their choice of subjects to the Changing the Game program, 75% felt that the program increased their interest in computers/ programming/ coding while 37.5% felt that the program educated them about different career pathways.

"I want to become a doctor, but after going through this program, I know that there are other options too."

"It gave me exposure to coding and now I know that one can make a career out of it too."

Skills and Learning

We asked respondents to self assess and share if they felt that undergoing the program had resulted in any changes in them with respect to academic performance, communication skills, career aspirations and ability to work in a group.

Nearly 53% of the respondents felt that there was an improvement in their communication skills, 32% felt that their career aspirations had changed, while 16% felt that their ability to work in a group improved. Only 11% felt that the program had an impact on their academic performance.

A lot of the respondents felt that because the sessions were delivered in English it helped them practice and improve their English language skills.

"Through this program, my confidence level has increased. I can now interact with other people. It has helped me to gain confidence. Also it has contributed to my communication skills."

"Changing the Game program gave me a lot of exposure and in starting i wanted to join Google due to the things I was doing on the computers"

"Because I am doing this program and making stories, games etc on my own... So I thought If I can do it in this program, then why not in my regular classes."

"In this lab, all speak in English and all the content, whether on SCRATCH or the support videos on youtube are in English. So watching them I did learn to some extent. In our regular classes there is only Telugu, so there is no help in learning English. We also used to form groups during activities, and every time I used to get a different partner. So it taught me how to interact and listen to each other's point of view."

TEACHERS

Teachers play a pivotal role in this program as they are secondary observers about the changes that Quest is trying to bring in these students. Hence their participation in the program (even superficially) is very critical. These teachers were there in school when the program was launched and also participated in the events conducted under this program. Since the beginning the Principal (he was transferred in 2018) and 2 English teachers were engaged with the program. They attended sessions held by the facilitator and also helped and oversaw permissions for the students' lab-based peer learning sessions when the facilitator wasn't present in the lab.

A total of 7 teachers (4 female, 3 male) were interviewed as a part of this study. 4 of these teachers handled science subjects while 3 handled English and Telugu subjects. On an average the teachers had more than 21 years of experience and had spent nearly 8 years at Kukatpally school.

For the purpose of analysis we are presenting the findings of the interview in two parts: i) Feedback and impression about Changing the Game program ii) Impact that the program had on students - as observed by teachers

Feedback and impression about Changing the Game program

Impact that the program had on students - as observed by teachers

FEEDBACK AND IMPRESSION ABOUT CHANGING THE GAME PROGRAM:

We asked teachers to describe the Changing the Game program in their own words. For almost all the teachers, the program helps familiarise students with computers and programming.

"Technology is changing very fast and logical thinking is required a lot. This program is helping kids to develop logical thinking and trying to bridge the gap. It is doing so by storytelling methods using characters and games."

"In our schools, the students come from such a background that they do not get opportunity to learn computers."

Out of the 7 teachers who were interviewed, 3 had attended at least one session that was led by a Quest Alliance facilitator. The teachers who attended the session all agreed that students took active interest in the program. However, none of the teachers had looked at the student workbooks.

We asked the teachers what parts of the Changing the Game program they thought the students liked the most. While some teachers felt that they did not have enough information to provide an answer, the others felt that the fact that the students got to use computers to build games and stories using SCRATCH and exercise their creativity was the most attractive part of the program for students.

The part of the program that teachers themselves liked the best was that student's got to use their creativity, apply logical thinking and reasoning and improve their communication skills.

"I also liked the stuff made by the students on the computer. The stories made by them are out of their own imagination and hence it promoted creativity. This side of student I liked the most that they are making things out of their own interest"

"They (Students) are motivated by participating in the program. They share about better career options. They tell that their English is improving and communication skills are building up. They talk about innovation more now"

"Some students also complain that they are not getting enough opportunity to sit in front of the computer. But this is a general thing with kids of this age."

All of the teachers had taught classes where students had undergone the Changing the Game program, however only 3 out of the 7 teachers had spoken to their students to gather feedback directly from the students about the program.

We also asked teachers to share what they would do differently if they were part of the Changing the Game program team. 5 out of the 7 teachers felt that it would be good to formally introduce the program into the academic calendar of the school so that any miscommunication between teachers and facilitator could be avoided. 3 of the teachers felt that there should be better integration between the main subjects that the students study and the program curriculum.

Other feedback included: more facilitators and computer systems for students, advocating with state government for the inclusion of the Changing the Game curriculum into the syllabus, volunteers to tackle absenteeism at school etc.

IMPACT ON STUDENTS |TEACHERS' IMPRESSION|:

We asked teachers whether they had perceived any effect on the student's academic performance. 4 out of the 7 teachers felt that there had been some effect on the student's academic performance. When asked to elaborate, the English teacher shared that she had observed that the spelling mistakes that the students used to make earlier have reduced significantly.

Another teacher felt that there were both positive and negative effects where student's confidence in interacting with technology has increased a lot but with the result that time spent using devices is taking interest away from regular studies. On the other hand, another teacher has used the student's interest in Changing the Game program to motivate students.

"Students liked to go to this lab so much that I used to ask them to complete all assignments in my subject and then only then can go to the lab. They used to finish the task immediately and then run to the Lab".

"They (students) wanted to be like them (AMD volunteers). AMD volunteers used to share their experiences with these kids and used to help them with their career related questions."

Teachers felt that interaction with AMD volunteers was beneficial to the students because the students looked up to the volunteers who served as possible role models.

Under the program there are events like **Share Out, AMD Office Visit, Q2L Summit etc.** that Quest Alliance conducts where Students present their projects. Not only students but teachers also attend these events as chaperones. The platform provides useful exposure as people from various regions come here and share their experiences.

PRINCIPAL

Kukatpally school has had two different principals whose tenure coincides with the implementation of the Changing the Game program at the school. For the purpose of this study we spoke to both of them about their impressions of the Changing the Game program.

Both the principals felt that the program was successful in introducing computers to students who would otherwise have never been exposed to them. One of the principals felt that students also benefited from working together and started to mingle with each other. The same principal also felt that the school's exam results had improved drastically (from 50% to 75%) during the years' when the program was being run in school. School records were not examined for these years to support this claim.

When asked to share what elements of the program did not work as well, one of the principals said,

"The course matter is very limited. In the program what is taught is Story making and Games. If there are other activities also linked to the program it would have been fantastic. For example add experiments, add maps, locate countries, capitals etc in the program through your stories."

Both the principals felt that there had been a positive change in students' academic performance and communication skills. They felt that there had been no change in students' career aspirations and were divided on whether the program had an effect on students' ability to work in a group.

"Earlier students used to roam in corridors but now they have the urge to go to the computer lab and do their projects. Whenever they get free periods, they head towards the lab. In this way their time is getting utilized. Though there are no communication classes in this program, they are interacting in English language in the class which is helping them. Also the group working is giving them a habit to sit together and discuss. This thing we are also using in our classes."

However, the principals felt that the program had little to no effect on the teachers though the teachers do use the computer lab that has been set up as a part of the program to prepare their lessons. The lab is operational daily between 1:00 pm to 4:30pm and during the summer and winter break is used by the District officials.

In terms of the positive or negative changes that have been observed at the school, the principals felt that there are many positives such as having an inhouse lab has reduced dependency on others, students' attendance and behaviour has improved. On the other hand, both the principals were worried that the program was resulting in students' becoming hooked to gaming and apps, whereby students were spending time in cyber cafes after school hours.

Changing the Game curriculum hasn't been integrated into the school's curriculum so far though one of the principal shared that some teachers have started using the project based approach in their classrooms after seeing how students had responded to project work in the Changing the Game program.

We asked both the principals to share what they would do differently if they were part of the Changing the Game team. Some of their suggestions are as follows:

- **Introduce the program from Class 6th to 9th**
- **One facilitator is not sufficient for the number of students in each class**
- **Curriculum should be designed in a layered manner so that with every class, difficulty level should be increased**
- **Single lab is not sufficient for the students**
- **Full time classes at the computer lab should be introduced on a daily basis.**
- **Link the curriculum with the mainstream subjects so that Teachers also get involved and Student learn too**

AMD VOLUNTEERS

The interviews were held with 4 volunteers (2 male and 2 female) from AMD. The average age of the volunteers was 33 years. All of the volunteers had first heard of the volunteering opportunity through the company's CSR site which lists volunteering opportunities for AMD employees.

For two of the volunteers, reasons for picking this particular volunteering opportunity was that they felt that during their own schooling days they had missed out on opportunities to learn computers and knowing what they missed out on they were particularly drawn to this program. For one volunteer, the combination of "interactive learning of 21st century skills and coding" was particularly attractive. For all of the volunteers the chance to work with and motivate children from communities which are resource scarce was the primary motivating factor.

Activities that the volunteers had participated in included sharing of experiences with students, career counselling for students, project share out events, conducting quizzes on technology, hosting some students for Game Event at AMD's campus etc.

For all the volunteers, interaction with the students, listening to their creative ideas and being able to answer their questions was the favourite part of the volunteering experience.

"Interacting with kids, listening to their ideas and resolving their doubts was my favourite part. I love to hear what students think and what is their imagination."

"During one of the events, I was made a judge of it and had to evaluate the projects made by these kids. That was my favourite part. I evaluated the projects based on defined parameters."

All of the volunteers were keen on continuing their engagement with the program for the reasons outlined already (interaction with students, motivating students, sharing experiences, helping them prepare for the future).

While most of the volunteers felt that students' who were part of the program intervention had benefited in terms of improved communication skills, exposure to technology including Virtual Reality, improvement in thought process- two of the volunteers voiced the concern that due to resource constraint not all students were able to participate.

"I feel with these students, language is sometimes an issue to understand the context effectively. They are not fluent in English at this stage, and hence I feel that at times they skip the information shared with them."

"The Resources at the school , the computers and Staff, are not sufficient. I feel that due to this, there are many kids who are not able to participate and are lagging behind."

The volunteers also had suggestions on how the program may be improved for the students. These included: linking program activities to the school's existing curriculum, varying the content, extending the program to rural schools amongst others, ensuring adequate resources - teachers and computers- are available at the school.

"During any activity organised, at school or outdoors, these kids start preparing for that event. It's a kind of stress that kids undergo. Students should be motivated to join the event without any stress and speak up their mind."

"We need to link the curriculum with their mainstream subjects. This is how we can proceed towards their dual learning. This will also help them to relate to what they are making and learn at the same time."

"A directional approach or guided approach will result in further learning. For example, If a potter makes vessels. What if we guide him so that he can make other creative stuff out of it?"

KEY TAKEAWAYS FROM IN-DEPTH INTERVIEWS:

- For the students the biggest benefit of the project seems to have been on their communication skills and in familiarising them with computers. Nearly 1/3rd of the respondents felt that the program had an impact on their career aspirations.
- Interaction with AMD volunteers was very useful. The encouragement and advice provided by them was welcomed by the students.
- Integration of the program's pedagogy and curriculum by the school hasn't happened yet. While the school administration and teachers are appreciative of the program's evident outcomes, adoption of the program may be more successful if it came as a directive from the district / state education department.
- The computer lab has proved to be beneficial not only tot the students but also to the teachers and HM who have started using the resources to do online research for their lesson plans
- Common recommendations for program improvement from all stakeholders included: expanding program curriculum beyond SCRATCH to encompass computer literacy especially related to commonly used computer software, better integration with school's existing curriculum, increasing the number of computers available in the lab, having a differentiated curriculum for each academic year etc.

- **Research Question 3: Do the students in Kukatpally school demonstrate 21st century skills? If yes, how?**

21ST CENTURY SKILLS

As a part of our interviews with the student and alumni respondents we also tried to assess their skill level with respect to certain 21st century skills such as **communication, critical thinking and problem solving and creativity.** Respondents were given hypothetical problems to which they had to find plausible solutions, and a task to complete to assess their creative thinking ability.

It is important to clarify that in the absence of a counterfactual it is not possible to attribute students' possessing 21st century skills to the program. The purpose of this analysis was to examine whether students exhibited 21st century skills and whether there were certain skills that had been more developed as compared to other 21st century skills. A second objective was to test whether such a framework can be used in the future to create a robust analysis of the program's Impact through a baseline-endline analysis.

- **COLLABORATION:**

We asked respondents whether they had enjoyed working in a team and what parts of working in a team were enjoyable or not. Additionally we asked them to try and resolve a hypothetical dispute in a group. Based on the responses, out of a maximum possible score of 2, respondents got an average score of 1.2. Respondents in Class Xth got a score of 1.13 (out of 2) while alumni respondents got a score of 1.22 (out of 2). Male respondents got an average score of 1.19 and female respondents got a score of 1.20. **The responses were evaluated on the complexity of their response and whether the response demonstrated a collaborative spirit.**

- **COMMUNICATION**

We asked respondents to share their degree of comfort in interacting with different people in their life. We additionally asked whether they felt they could participate in their family's decision making process and whether their parents listened to them. On a maximum possible score of 4, respondents scored 3.4 with respondents in Standard 10th scoring slightly higher (3.5) than alumni respondents (3.33). **Female respondents scored slightly better (3.4) than male respondents (3.33).**

- **CRITICAL THINKING AND PROBLEM SOLVING**

Respondents were asked to identify what they thought was a major problem in their city and propose possible solutions to the problem. The answers were rated on the basis of the articulation of the problem and the complexity of the solutions proposed. Additionally we gave students two hypothetical problems to which they had to think of solutions to. Out of a maximum possible score of 3, respondents were given a score of 1.98 with alumni respondents getting a slightly higher score of 2.03 while respondents in Class 10th achieved a score of 1.94. **Female respondents achieved a higher average score of 2.05 as compared to male respondents 1.97.**

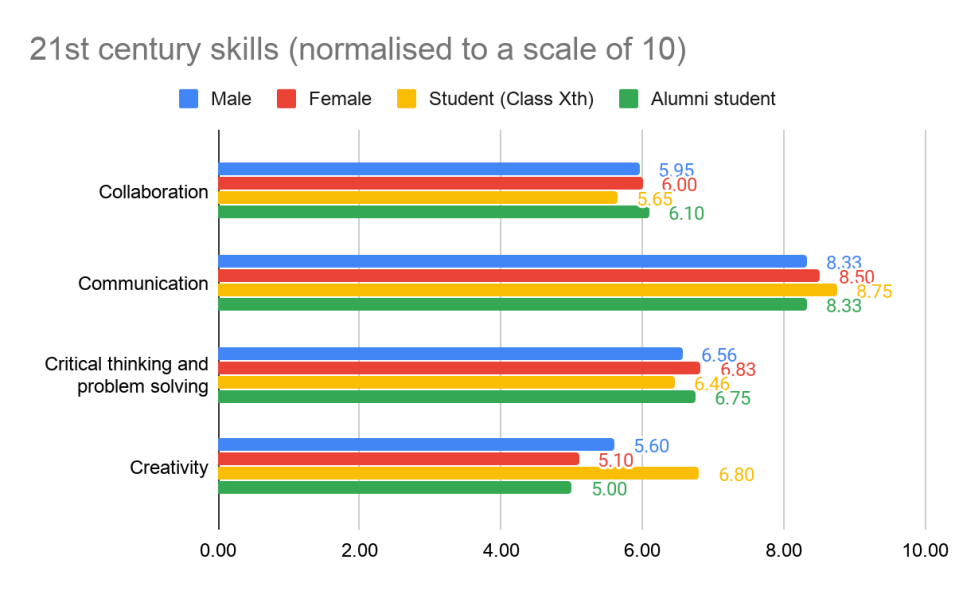
CREATIVITY

A simplified version of the **alternative uses test**[7] was employed where respondents were given a piece of string and had to list down the number of uses they could think of. While the original test evaluates subjects using four parameters including fluency, originality, flexibility and elaboration, here we have restricted analysis to include fluency i.e. the number of unique answers that each respondent was able to provide. Answers ranged from 2 to 16 unique uses.

Based on this analysis, respondents in Class 10th (average score of 0.68 out of a maximum possible score of 1) performed much better than alumni respondents (average score of 0.5 out of a maximum possible score of 1). These scores were also similar to the scores respondents gave themselves on creativity, where respondents in Class 10 gave themselves a score of 0.7 (out of a maximum possible score of 1) while alumni respondents gave themselves an average score of 0.6 (out of a maximum possible score of 1). Male respondents scored an average of 0.56 as compared to female respondents who scored an average of 0.51.

OVERALL ANALYSIS OF 21ST CENTURY SKILLS IN RESPONDENTS

In the figure below, the scores have been normalised on a scale of 10. Overall, female alumni respondents outperformed both their male counterparts and the female respondents in Class Xth when it comes to communication, collaboration and critical thinking skills. Male respondents did better on creativity than female respondents but lagged when it came to communication and critical thinking and problem solving. Overall, respondents performed well when it came to communication but may need more inputs to develop creativity, collaboration and critical thinking skills.



These insights can be borne in mind while developing curriculum and during program implementation. Giving students more opportunities to show their creativity and develop problem solving skills need not be limited to SCRATCH programming and can be developed through activities which can be done in an analog environment.

[7] JP Guilford Alternative Uses test, 1967

Scores from Dr SCRATCH Analysis

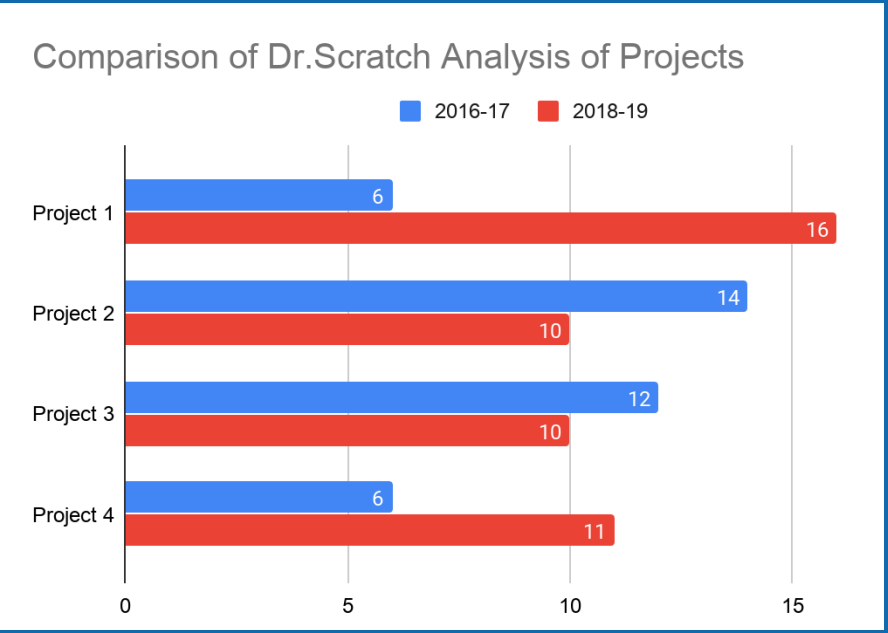
A sample of 4 projects was selected for analysis from the intervention year 16-17 and 18-19 respectively. **Dr. SCRATCH**[8] , an analysis tool for SCRATCH projects was deployed and it was found that there was a 10 point jump in terms of total score and 3.5 point jump in terms of average score.

These scores are calculated on the basis of following parameters:

- Flow control
- Data representation
- Abstraction
- Parallelism
- Logic
- Synchronization

The parameters used by Dr SCRATCH assess computational thinking and logic used by students in their project. The improvement in scores for most of the students' project indicates that prolonged exposure to the program led to an improvement in computational thinking skills.

Going forward the program's M&E framework will incorporate analysis by Dr SCRATCH to assess students' progress in skills acquisition and learning.



In 2016-17, most of the students were at the Basic level, while in 2018-19, they were at the Developing stage, which is a significant achievement apart from already great artefact ideas that had emerged from these projects.

[8]http://www.drscratch.org

RECOMMENDATIONS BASED ON THE INTERVIEWS CARRIED OUT WITH DIFFERENT STAKEHOLDERS:

The following recommendations are being made for consideration of the Quest Alliance team:

CURRICULUM

- A curriculum framework for Class 8th and 9th should be developed with clearly defined expected learning outcomes and aligned assessment tools to help the facilitator gauge students' comprehension.
- Science teachers at the school can be consulted to examine possibilities of integrating group work and projects that align with the science curriculum at school.
- QA team should work with the school authorities for the inclusion of the program in the school timetable. This will reduce some of the misgivings that the teachers had expressed about the program eating into some of their teaching period.
- Since a good percentage of students are active on social media platforms, students can also be taught how to apply critical thinking lens to detect fake news and prevent its spread.

PARENT ENGAGEMENT

- A strategy for a sustained parent engagement needs to be formulated. Parents will have a critical role in supporting the career aspirations of the students. Therefore the communication to parents about the program's objectives and the expected benefit to their wards could be routed through the School management committee (or its equivalent).

TEACHER AND PRINCIPAL ENGAGEMENT:

- While support from school authorities has been good, teachers seem to have had limited exposure to the program. Quarterly or half yearly review meetings can be held by the facilitator to share progress and get feedback from teachers. Student progress should be shared on a regular basis with the school authorities to help them visualise the changes that are happening as a result of the intervention.
- School authorities and teachers can be involved at an earlier stage in the planning of share out events so as to co-own the event.
- Efforts should be made to identify one or two teachers who have shown interest in the program activity and create a mechanism for recognising their effort and moulding them into becoming champions for the program

MONITORING AND EVALUATION FRAMEWORK

- A relook at the program M&E tools is needed especially the student learning outcomes framework which has relied primarily on a baseline and endline evaluation. Framework should examine the possibility of secondary data collection including school examination results to verify some of the claims made by the teachers and principals about improved academic performance from an outcome/ impact evaluation point of view
- 21st century skills assessment should be done with a sample set of students at the beginning and end of the year. This can be led by the M&E officer
- Monitoring visits should be carried out by the Program officer / M&E officer at least once in six months to provide support to the facilitator and strengthen relations with the school authorities
- Artifacts developed by the students can be evaluated based on rubrics so as to help the facilitator identify areas of improvement for students.

AMD VOLUNTEER ENGAGEMENT:

- Remote volunteering opportunities can be explored given that the school has a dedicated computer lab
- Volunteer program can also be expanded to other students in the school who are not a part of the program intervention

Annexure 1: Interview Guide

STUDENT INTERVIEW GUIDE

Introduce Yourself

Hello my name is XYZ and I am here today to talk to you about your participation in AMD Changing the Game program. I would like to ask you a few questions, I will also be recording your responses on a sheet of paper. If you would like to participate in this study that I am carrying out, please sign your consent here. If you do not wish to participate we will end this conversation here.

Student Signature

Student Profile

- Name
- Age
- Gender ☐ Male ☐ Female ☐ Other
- Number of family members
- Father and mother's occupation

Program Feedback

- If you were to describe Changing the Game program to a friend of yours who does not study at your school, what would you tell them
- What were / are the different activities that were/ are carried out as a part of the program??
- Do you recall the SCRATCH project that you had worked on in VIII/ IX standard?

  a. If yes, can you describe your project to me?
  b. What do you remember the most about creating that project? (Note to interviewer: probe additionally for student's experience of working in a group, what the experience was like, whether they had worked in groups before, were there conflicts that arose and if so how did the group resolve those conflicts?)
  c. Have you used SCRATCH outside of your school? If yes, where and how have you used it?

- Were you part of any share out events?

    a. If yes, do you remember how you felt about participating in the share out event - were you nervous, excited, bored

- Did you visit AMD's campus / interact with any of AMD's volunteers ? If yes, how did you find the experience?

- Did you find the curriculum and the workbooks that you received interesting?
    a. If yes, what was the most interesting / fun part? If not, why not?
    b. Did you find it hard to manage / process the extra studies of Changing the Game along with the other subjects?
        i. If yes, what did you do to cope?
        ii. If no, do you think any of your batchmates struggled with it?

- Have you decided what you want to study in higher classes?
    a. Why that particular stream?
    b. If not, what challenges are you facing in making a decision?

- Do you think Changing the Game program played / will play any role in influencing your choice?
    a. If yes, how?

If I asked you to give the Changing the Game program marks out of 10 based on how interesting and useful you found the program, how many marks would you give it?

a. Why that score?

Note for interviewer:

This section is to assess students on 21st century skills. These questions are meant to be guides and are deliberately kept open ended. Analysis would primarily be driven by the notes that you take so make sure to take extensive notes. Younger students might need some prompts but ensure that you aren't in any way leading the students. Questions will keep getting tougher so make sure you do not rush the student for an answer.

Student Assessment Tool

COMMUNICATION

- When you need advice/ guidance about the following, who do you reach out to? (Interviewer to put a tick mark in the relevant box)

	Parents	Teachers	Siblings/ Cousins	Friends	College/ School	Other Relatives	NA/ Do not talk
Career							
Studies							
Personal Life							

- Do you talk to your parents about what happens in your school or classroom?

  ☐ Yes ☐ No

- Do you participate when your family is making decisions, for example about which TV / vehicle to buy or which doctor to visit when someone is ill?

  ☐ Yes ☐ No

- Do you think that your parents listen to you?

  ☐ Yes ☐ No

- Imagine you are facing some trouble in your school where someone older is teasing or bullying you. With whom would you talk to about this for advice?
- Do you think your friends come to you for advice? If yes, why do you think that is?
- When you think back and compare your current self with yourself before you were part of the Changing the Game program do you think that you are more confident in communicating with different people including strangers?

  a. Why do you think that is?

COLLABORATION

- In the past one year have you been a part of any team (sports team, study groups, student clubs, interest groups etc) at your school ?

    a. If yes, did you enjoy working in a team?
    b. What parts of it did you like or not like?

- Imagine you are a part of a class group that has been tasked by your class teacher to plan the class picnic. There are 6 of you in the group and everyone has a different idea about where the picnic should be held. The discussion is going nowhere and the teacher is waiting for the group's decision. What should the group do in this case to work together?

CRITICAL THINKING AND PROBLEM SOLVING

- In your city/ neighbourhood, what do you think is the biggest problem that citizens face? How do you think that this problem may be addressed?
- Imagine that you have a friend Meenu, who is 16 years old, and her parents have received a marriage proposal from a rich family. They want Meenu to get married this year and drop out of school. Meenu however is not keen on getting married this early. She wants to study further and become a teacher. She is not sure how to have this conversation with her parents and comes to you for advice. What advice would you give her?

CREATIVITY

- Here is a piece of string. Can you write down all the different ways in which this may be used within 3 minutes? (Interviewer to note down the number of different uses, time taken to come up with answers, number of 'out of box' answers)

    a. How did you think you did on the test? Did you find it difficult to come up with answers?

- What does creativity mean to you? Do you think any of your friends and family members are creative? Why do you say so?
- If you were to give yourself marks out of 5 (5 being the highest) on how creative you are, what marks would you give yourself? Have you done / made something that you think showed off your creativity?

Interview Notes

TEACHER INTERVIEW GUIDE

Introduce Yourself

Hello my name is XYZ and I am here today to talk to you about AMD Changing the Game program that is being implemented in the school that you are/ were a part of. I would like to ask you a few questions, I will also be recording your responses on a sheet of paper. If you would like to participate in this study that I am carrying out, please sign your consent here. If you do not wish to participate we will end this conversation here.

Teachers' Signature

Teacher Profile

- Name
- Age
- Gender ☐ Male ☐ Female ☐ Other
- Subjects Taught
- Years of Teaching Experience
- Number of years as teacher at current school

Program Feedback

- If you were to describe Changing the Game program to another teacher who teaches at a different school, what would you tell them?
- Have you attended any Changing the Game session / event that was led by a Quest Alliance facilitator?
  a. What was your impression about the facilitator's style of teaching and engagement?
- Have you seen the student workbooks for Changing the Game ?
  a. If yes, what are your views on the content and design of the workbooks?
  b. Did you think that the content was relevant to the students at your school?
  c. If yes, did you use any part of the workbook in your own classroom session?
- Have you heard of the term 21st century skills before? If yes, what do you think these are?
- What parts of the program did you think the students enjoyed the most?
- What parts of the program did you as a teacher find the most appealing?

- Did you participate in any of the program activities - share out camps, volunteer visits, creation of SCRATCH projects, Q2L event?
    a. If yes, what were your impressions of these activities?

- Are / Were any of your students part of the Changing the Game program?
    a. What is the feedback you have heard from the students about the program?

- Do you think that the program led to students becoming more interested in computers and coding?

- Do you think the program in any way had an effect on students' academic performance?
    a. If yes, could you expand on this by sharing one or two examples that you can recall where a student's performance was affected either positively or negatively?

- To what extent do you think the interaction with AMD volunteers was beneficial to the students? Why?

- If you were a part of the Changing the Game program team are there any things that you would do differently?

Note for interviewer:

The questions below are meant to guide the interview in the right direction- however the interviewer should feel free to reorder questions, add more questions depending on the responses of the teacher. Some teachers may require a few prompts (key words) to open up but do not lead or guide the teacher's responses in any way. Look out for key words like SCRATCH, 21st century skills, confidence, team work, career, coding etc.

Interview Notes

PRINCIPAL INTERVIEW GUIDE

Introduce Yourself

Hello my name is XYZ and I am here today to talk to you about AMD Changing the Game program that is being implemented in the school that you are/ were a part of. I would like to ask you a few questions, I will also be recording your responses on a sheet of paper. If you would like to participate in this study that I am carrying out, please sign your consent here. If you do not wish to participate we will end this conversation here.

Principals' Signature

Principal Profile

- Name
- Age
- Gender ☐ Male ☐ Female ☐ Other
- Subjects Taught
- Years of Teaching Experience
- Years served as principal at current school

Program Feedback

- If you were to describe Changing the Game program in a few lines to someone who hasn't heard of the program ever what would you say?
- How has the association with the Changing the Game program been like for Kukatpally school?
- What do you think have been the elements of the program that worked well at Kukatpally school? What did not work so well?
- Do you think that the program brought about any change in:

a. Students'

i. Academic performance	☐ Yes	☐ No
ii. Communication skills	☐ Yes	☐ No
iii. Ability to work in groups	☐ Yes	☐ No
iv. Career aspirations	☐ Yes	☐ No

If yes, explain how

b. Teachers'

i. Outlook towards careers in coding for students ☐ Yes ☐ No

ii. Teaching methodology ☐ Yes ☐ No

iii. Attitude towards students and parents ☐ Yes ☐ No

If yes, explain how

c. Parents'

i. Participation in school events ☐ Yes ☐ No

ii. Interest in child's education and progress in school ☐ Yes ☐ No

If yes, explain how

- To what extent do you think the interaction with AMD volunteers was beneficial to the students and the school? Why?
- The program also installed a lab with 20 computers at the school.

  a. Is the lab fully functional still? ☐ Yes ☐ No

  b. How are the students & teachers using the lab currently?

  c. What do you think are the positive or negative changes (if any) that have happened in the school because of the lab?
- To what extent has the Changing the Game curriculum and approach been integrated into the school's own curriculum and functioning?

  a. If to a good degree, can you share one or two examples where this has been done?

  b. If not at all or a limited degree, do you think that there is an advantage in adopting some of the elements of the Changing the Game program?
  i.If yes, what needs to change for this adoption to happen?
- Do you think that the program was able to achieve what it set out to do?
- If you were a part of the Changing the Game program team are there anything that you would do differently?

Interview Notes

AMD VOLUNTEER QUESTIONNAIRE

Introduce Yourself

Hello my name is XYZ and I am here today to talk to you about AMD Changing the Game program that you were a volunteer for. I would like to ask you a few questions, I will also be recording your responses on a sheet of paper. If you would like to participate in this study that I am carrying out, please sign your consent here. If you do not wish to participate we will end this conversation here.

Volunteer's Signature

Volunteer Profile

- Name
- Age
- Gender ☐ Male ☐ Female ☐ Other

Program Feedback

- How did you get started as a volunteer for AMD Changing the Game program?

    a. How did you hear about the volunteering opportunity?
    b. Why did you sign up?

- Have you been a volunteer for other initiatives before?
- What activities are/ were you involved in as an AMD Changing the Game volunteer?
- What was your favourite part about being an AMD Changing the Game volunteer?
  Are you still a volunteer with the program?

    a. If no, what were the reasons for dropping out
    b. If yes, what has kept you going?

- What is your impression of the students that you worked with? What do you think they took away from the time they spent with you?
- Do you have any suggestions for the program team to improve the volunteer program for both the volunteers and the students

Interview Notes

Annexure 2: Share out Event Evaluation Rubric

Grade the learner's projects on a scale of 1-4, 1 = Needs more work, 2 = Average, 3 = Good, 4 = Excellent
RUBRICS
Idea: Originality, Clarity, Message and theme (Storyteller)
Originality – project has a unique idea
Clarity – Project had a clear predefined goal and was easy to use
Entertaining and Fun – project is engaging and easily enjoyed by others
Project message and theme: Project message is very clear and is within the assigned theme
Idea: Originality, Clarity, Message and theme (Storyteller)
Usage of sprites, creating or editing sprites to create new costumes
Usage of minimum 2 backdrops, creating or editing sprites to create new costumes
Different types of Command blocks used
Usage of events and broadcast and receive for conversation,
Depicting understanding of blocks and how they work together
Presentation (Presenter)
Presenting projects with confidence, good eye contact and body language
Clearly articulates the idea of the project and answers questions confidently
Project Functionality (For Storyteller, TechWizard and Presenter)
Project works correctly and does not have any major failures

CHANGING THE GAME

AMD

Enabling today.
Inspiring tomorrow.

QUEST ALLIANCE