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Education export:

Expanding KAMK portfolio in India



Business Administration

School of Business

Spring 2019



**KAMK • University
of Applied Sciences**

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Title of the Publication: Education export: Expanding KAMK portfolio in India

Degree Title: Bachelor of Business Administration

Keywords: education, export, development, India, Finland

Education is a human resource allowing societies to progress socially and economically. Beyond the common definition of formal schooling, education as a trait is present in all living beings to pass on fundamental knowledge and values. Throughout human existence, education has adapted and grown to fit the needs of societies and their development. In the present, communities shape education to meet the challenges of social and technological development.

Andhra Pradesh India is a new state facing a recent territorial division, with the need for governmental and public facilities to provide sufficient services for the residents. As the state lacks the educated professionals, the government invited foreign parties to provide tertiary education. Kajaani University of Applied Sciences (KAMK) participated in the project and provided a summer school course in game development for 500 students. As negotiations continue for projects during 2019, research is undertaken to examine possibilities for offering further courses in other areas.

The result of the research indicates that the current educational programs in place need to change to provide the knowledge necessary for sustainable development of the state. Additionally, the existing institutions and their capacities are insufficient for population needs. This research identifies that information systems and healthcare are areas where KAMK can offer education services.

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ABBREVIATIONS

GDP	Gross domestic product
KAMK	Kajaani University of Applied Sciences
[From the Finnish language: Kajaanin Ammattikorkeakoulu]	
APSSDC	Andhra Pradesh State Skill Development Corporation
EDB	Economic Development Board
APIS	Andhra Pradesh Innovation Society
UNESCO	United Nations Educational, Scientific and Cultural Organization
OECD	Organization for Economic Co-operation and Development
TVET	Technical and vocational education and training
PISA	Program for international student assessment
EEF	Education Export Finland
IGDC	India Game Development Challenge
SRM	Sri Ramaswamy Memorial
INR	Indian rupee
MOA	Memorandum of agreement
VTIP	Vocational training improvement project
IT	Information technology
ICT	Information and communication technologies
ECTS	European Credit Transfer System
SME	Small and medium enterprise
USAID	United States Agency for International Development

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1 INTRODUCTION

Following the Telangana movement, where the Telugu speaking people of the Andhra Pradesh (AP) state protested for the creation of a separate state, the entity split into the newly formed Telangana and Andhra Pradesh states. As the former capital of Andhra Pradesh, Hyderabad has become the new capital of Telangana; AP required a new location and facilities to house the government employees. The government decided to build a new capital city on the south bank of the Krishna River, northwest of the city Vijayawada, called Amaravati. While construction of the city is underway, the Telangana government agreed to a 10-year transition period while hosting the Andhra Pradesh government in Hyderabad. The government's plan is to make Amaravati a smart city equipped with the newest technology in sustainable housing, transportation management, and public services. To achieve sustainable growth, the state needs to invest in education to train the workforce. Due to lacking capacities and resources to educate the professionals, the government invited foreign institutions to deliver education programs and develop curriculums suitable for the local needs.

Andhra Pradesh State Skill Development Corporation (APSSDC) is the governmental body providing educational and skill development programs to the citizens. The programs cover vocational level courses for professions such as electricians, plumbers, tailors, cooks and basic computer courses for data input jobs.

Andhra Pradesh Innovation Society (APIS) provides company development support to those interested in starting their own business. APIS provides startup and incubation programs and spaces to support the new companies.

Economic Development Board (EDB) oversees the implementation of programs facilitated by APSSDC and APIS. EDB works directly with the Chief Minister to ensure all plans and programs are accomplished.

Finnish universities facing a decline in applicants, an important source of income have taken the opportunity to establish pilot programs with local agencies to train the first generations of professionals.

Kajaani University of Applied Sciences (KAMK) deployed an 8-week pilot program based on its existing curriculum in game development education, where students develop a commercially viable game. However, the curriculum needed substantial adjustments due to the knowledge gap that was present. With the experience gained in understanding the educational methods and cultural differences, both APSSDC and KAMK have identified key problem areas and the necessary steps have been taken to adjust better implementation and execution of the teaching and comprehension by the students. The long-term goal of the collaboration between Finnish universities and the Indian government is to establish quality education for the local employment needs and deployment of business development activities beneficial for startup growth.

The objective of this paper is to analyze the current development plans set out by Andhra Pradesh public authorities and determine the fields where KAMK can provide additional services through its portfolio. The chosen method to identify the potential fields is qualitative research. The reasoning for choosing qualitative research is an alternative insight into the local employment and education needs beyond the available statistical data, as a secondary analysis. By using qualitative research to conduct education analysis in Andhra Pradesh, a recommendation is made on how to continue education activities. Through a set of personal questions, respondents describe themselves and are stimulated to reflect and relate with the questionnaire and its purpose. The second half of questions asks the respondents to provide descriptive and comparative answers, to validate the objectivity of analysis results.

The findings of the research highlight potential areas for portfolio expansion. Based on the data collected through the research and publicly available reports, KAMK can develop offers for further educational projects for Andhra Pradesh.

2 EDUCATION AS A COMMODITY

From a young age on, every person is exposed to values that shape their society, regardless of geographical location, a period of time or race. Each individual is raised with the values of that society, placing higher importance on values. With human development, education has developed and allowed generations to carry on knowledge to future generations. Just as with values, each society has its perception of education and how it is best to teach. Some more than others have succeeded in finding the most effective methods. As a commodity, education allows societies to constantly grow and leverage it for the wellbeing of all. A commodity providing tangible results attracts others in the search for the success formula. Leveraging the commodity of education is a new source of income, ready to be monetized.

2.1 Economics of education as a long-term investment

Education as human capital is the foundation of any society seeking human and economic development. As such, education is each individuals' intangible asset, which cannot be transferred entirely to others. To take full advantage of this human capital, the individual must do the learning in person, which requires an investment of time and in many cases other resources, such as money or a teacher or mentor. As a human capital, education depreciates over time. In some cases, becoming obsolete, whether it is in a single persons' life span or through multiple generations (Psacharopoulos, 2013, 12).

To better understand the motivation of a government to invest in education, one must consider the broader implications and long-term benefits. In terms of investments, education increases the workers productivity and performance covering both the investment cost, increase in overall immediate first, and third-party performance. Therefore, investing in skilled labor leads to economic growth. The United Nations Educational, Scientific and Cultural Organizations' (UNESCO) report shows that every one US dollar spent on education can generate up to 15\$ in economic growth (Grant, 2017, 2). Although theoretically, such a conclusion is simple to draw, the practical requirements in a given country or region are difficult to forecast. The arguments against the feasibility of such deployment lie in the effective scaling of education for the work industry. In the context of education, the term scaling considers both qualitative and quantitative aspects in job market requirements of the future. Therefore the purpose of scaling is the transformation

of existing systems based on location requirements and cooperation with non-governmental organizations, research parties, policy-makers, the community, and institutions, as they are all beneficiaries of the results (UNESCO 2018, 79).

One of the challenges of humanity is poverty, with 836 million living in conditions where they are not able to satisfy their basic human needs. More than 800 million people live with less than 1.25\$ per day and lack access to clean water, proper diet and sanitation. In a developing country such as India, economic growth has resulted in better living conditions, but the progress is uneven due to limited access to employment opportunities, education, and poverty. Through planned programs and more proactivity, change can be made through small steps, such as raising awareness about sustainability to students about food waste or the re-use of old textbooks (UNESCO 2018, 79).

2.2 The contribution of education to development

While gross national product measures economic development, determining the impact of education on development is not directly measurable in the same manner. However, thoroughly developed innovation strategies have the potential to contribute in terms of quality and quantity, but with clear measurement and parameters (OECD, 2016, 13). With continuous development, academia undergoes a change in the role it carries in society. From institutions focused on delivering knowledge, their purpose further expands into an agency providing economic functions such as services, research, and development. As a more independent agency partaking in shaping the social structure, the academic institution facilitates the development process.

Education influences a countries' productivity through three channels. First, it increases the overall effectiveness of the workforce. Second, individuals with a secondary and tertiary degree are capable to transfer new knowledge, products, and technologies more effectively. Third, most noticeable in developing countries, investing in primary and secondary education that is available to all citizens, increases the skill cap and standard and is a fundamental part of the development process (Grant, 2017, 2).

By providing universal primary education and broad secondary education, up to 104 million people in the poorest countries could be raised out of extreme poverty while providing economic growth to the 46 poorest countries by 2.1%. With consistent investments

into secondary education, a clear boost to economic development is provided. Therefore, universal primary education needs to be supported by providing at least junior secondary education to as many as possible (IIASA, 2008, 1).

Primary education

Primary education is commonly the first stage of compulsory education. It varies in length and constitutes the first 4 to 6 years of formal education. Basic education has an impact on the earning potential provided by literacy, with the possibility to lift 171 million people in the poorest countries out of poverty if they left school with basic reading skills alone (Grant, 2017, 5).

Secondary education

It is the period following primary education and depending on the educational model of the country, covers the education from 5th through the 12th year of formal education. Higher levels of education are also linked to health factors, where mothers with higher formal education seek better medical treatment, take more health improvement measures for their children, have fewer children and are more likely to send their children to school, which in return provides better economic opportunities (Grant, 2017, 6).

Technical and vocational education and training

Technical and vocational education and training (TVET) provides the skills for working in a specific trade or craft, which are commonly manual or practical work operations and are traditionally non-academic. Having a technical or vocational level of education makes the transition into other professions difficult, as such individuals are less adaptable to changes in economic conditions due to the constraining nature of the training. With continuous technological improvements and automation, the skill requirement and ultimately, worker need will diminish. Therefore such education is less suitable for development, especially as the early gains diminish and provide minimal personal or societal growth (Grant, 2017, 12).

Tertiary education

The third stage of education includes studies in universities, colleges, technical training institutions, research laboratories and centers of excellence. The proportion of a population with higher education is an indicator of economic development and provides a higher potential for further growth (Grant, 2017, 9).

2.3 Export of education expertise

As a commodity, education can be considered a governments' long-term investment into the development of the society. Before deciding to invest, it is important to consider the national composition of the country and the resources to best utilize educational projects. Optimizing for local needs will aid in job creation and retention, to avoid brain drain. Similarly, excessive focus on an area may lead to counterproductive results, such as labor-intensive work providing limited or insignificant impact to development. With the increase of agricultural exports, the interest, or ambition for continuing education declines by 0.6 school years (Blanchard and Olney, 2017, 3).

For families in lower income brackets nationally, it is difficult to invest into prolonged education of their children, when schooling requires long term financial commitments. For middle- and high-income families, it is more common to send their children to prolonged education. The example outlines one of the fundamental effects of education access in circles where the possibility for committing to prolonged schooling is limited, due to financial reasons (Blanchard and Olney, 2017, 7). With nationally funded and foreign programs, the possibility is in theory equally provided to all. However, one must consider the various challenges arising from international projects and cooperation between to international, or foreign parties. The two parties may find it difficult to implement the actions due to contrasting societal values, the language barrier, culture, business culture, teaching methods and perception of time (Kurkisuo, 2016).

When education is provided between two international parties, the use of the exact term needs to be considered. Education export is both used for foreign students arriving to a local university as well as for a university going abroad, to the students. This paper refers to the latter, bringing KAMK's education program to the students in India. A local term used in Finland is *Export of education expertise*, referring to bringing Finnish education abroad to students, or through online courses.

Education export in Finland

In countries that lack the experts in education locally, governments look to other nations and third parties that are successful in the education sector. Finland, with excellent results in the Program for International Student Assessment (PISA), has consistently proven to be an expert in education. Therefore, the teaching methods and expertise are highly valued in developing countries.

Through investments and support, the ministries of education, employment, and foreign affairs have started the Future Learning Finland project in 2010, led by Finpro (now Business Finland). The projects' purpose was to establish plans to commercialize education expertise as an export commodity. As the first market region, Saudi Arabia was chosen. The reasons being a reform and significant investments into education, where Finland can provide not only the teaching, but a full service including the planning and building the educational infrastructure, with architects and construction companies from Finland benefiting as well. A support organization backed by the government provides more than just material support but brings credibility for the parties in the space.

As a continuation of the Future Learning Finland project, Business Finland continues to support education export programs through Education Export Finland (EEF) memberships. The aim of the membership is to provide networking opportunities, business opportunities, seminars and workshops, visibility and credibility. The membership is open to both companies and educational institutions that are interested in conducting international business through implementation and development of education exports (Rautakoura 2013)

3 EXPORT OF EDUCATION EXPERTISE TO ANDHRA PRADESH

Andhra Pradesh state covers a land area of 162,970 m² with a population of 49 million residents, averaging at a population density of 308/km². As one of the fastest growing Indian economies, the outlook is promising at an indicated growth of 11.61% gross state domestic product. The rapid growth of the industry is sufficiently followed by inflation and salary increase of 13.14% in the same period. The Andhra Pradesh GDP for the period of 2018 to 2019 is €104.98 billion. The main sectors of the economy are agriculture, industry, and services (Government of Andhra Pradesh, 2017, 16).

Agriculture generates 34% of the GDP while employing 55% of the workforce. The main products of agriculture are Cocoa, rice, sugarcane, cotton, mango and tobacco. The main industry branch is food processing and manufacture, which includes dairy products, vegetable processing, and edible oils (Government of Andhra Pradesh, 2017, 6). The industrial sector generates 22% of the state GDP while employing 10% of the workforce. The service sector generates 44% of the state GDP and employs 35% of the workforce. Included in the sector is tourism, transportation, finance, business and public services (Government of Andhra Pradesh, 2017, 18).

The report on total factor productivity shows that India's current economic growth is not driven by the addition of workforce to the scaling economy. In India's case, the past 20 years of growth are based on capital investments and an increased workload and productivity within the existing workforce. In the case of the 2006 GDP growth of 9%, the contribution of total factor productivity was 3.8%, capital contribution 5% and through labor 0.2%. As such, India receives more capital per worker for productivity increase, which serves as a sufficient alternative to creating more workplaces. With such high impact on its economy and the employment sector, entrepreneurship has become an effective alternative through the use of digital technologies. Digital technologies such as online e-commerce allow individuals to sell their products and services to both domestic and foreign customers. As a developing country, India seeks to bridge the gap in healthcare, education, and skills by investments into physical infrastructure to support a rapidly scaling growth in the digital environment (Government of Andhra Pradesh, 2017, 146).

The foundation for sustainable development lies in the societal development of public and private services, which serve as the driver for growth and employment generation. Three levels of penetration exist, with high penetration services such as construction

and finances contributing more than 5% of India's GDP. Medium penetration includes services that insufficiently penetrated and contribute 1 to 5% of the GDP such as education, healthcare, tourism, and transportation. Low are services that are emerging and contribute with less than 1% of the GDP such as the management of natural infrastructure and digital services. As such, more effective utilization of digital services and management of natural infrastructure is an important factor to sustainable growth. The solution to sustainable growth will be through online products and services providing payment and authentication solutions for individuals and enterprises. This layered solution of platforms paired with infrastructure is referred to as a *technology stack*. The potential of technology stacks is to enable growth and scalability by having public services and entrepreneurs at the core. To utilize the advantages of technology stacks, India requires a significant improvement in its education, especially in the emerging industry 4.0, which brings more automation and data exchange in manufacturing technologies. The fourth industrial revolution, industry 4.0 provides new opportunities to the individuals and companies to create and develop digital solutions in the areas of production, processing of goods and data, automation and the interconnectivity of devices and machinery in all sectors. With continuous research and development, the applications and implications of industry 4.0 become more significant and mainstream, allowing the expansion of use cases of the technology. In return, the need for workforce increases without raising the barrier of entry. Most noticeable in the case of India's technology stack where the fundamentals of connectivity are both present and invested into, through infrastructural development. While the technology stack has a positive impact on development, the initial step into such a project is the education and support to the local community which uses the solution (Jasperneite, 2012).

In rural India, where the economical and development gaps are below the Indian average, programs to educate and train the population in the use of these solutions, along with the increase of literacy and retention of individuals in the education systems – reducing dropout rates, are needed (Government of Andhra Pradesh, 2017, 5). When analyzing unemployment rates, it is important to highlight that individuals who are involved in any economic activity, for a minimum of 4 hours per day are considered as employed. Those helping or assisting in economic activities, even if unpaid are considered as employed. In 2012, the number of registered organizations was 19,591, of which 13,175 operate in the public sector and 6,416 in the private sector. Through these registered organizations, two million workers are employed. As per the 2011 census, unemployment in Andhra Pradesh stood at 12% in rural areas and 43% in urban areas (Government of Andhra Pradesh, 2017, 242 - 243).

The state has developed a broad welfare agenda to provide better living standards to its citizens and to increase the happiness index in the state. The agenda envisions an annual growth rate of 12% until 2029 supported by a high-level human development index of 0.90 by 2029, up from the 2018 report of 0.643. The current growth performance of the state indicates that the starting years are successful, with the average growth in the years 2015, 2016 and 2017 at 11% (Government of Andhra Pradesh, 2017, 3).

The success in growth has translated into salary increase as well, from the period of 2015 to 2017, from 107,276 Indian Rupees (INR) in 2015 up to 142,054 INR in 2017 on average. While the numbers are impressive, the growth of the economy has not transitioned into long term benefits. The government has decided to focus on accessibility and quality improvement of health and education. Additionally, public spending on health and education will increase to lower the individuals' expenses for these services. In education, school capacity has been increased and supported by accommodation options for the students. Investments into infrastructure have increased and will provide 2358 digital classrooms and internet connectivity to 3,500 schools (Government of Andhra Pradesh, 2017, 9).

One of the states' main sectors, agriculture has received large-scale support from the government to ensure competitiveness and high output of produce. The focus of the new agenda is with improvements in productivity and diversification while being sustainable and profitable. Within the production, the focus is on improvements on the production of milk, meat and egg products to provide incomes of 10,000 INR to each household. The fisheries sector in the state employs 1,450,000 people and is the highest fish and shrimp producer in India. Andhra Pradesh state produces more than 70% of all shrimp exports in India. The sector is reaching expansion saturation, and the government plans to invest further in processing and exports. As the primary sector reaches saturation, the government focuses on providing the necessary infrastructure to create a manufacturing sector environment, with a focus on small and medium enterprises. Within small and medium enterprises required in the manufacturing sector, the focus is on low skill labor-intensive industries to improve their growth and contribution to growth (Government of Andhra Pradesh, 2017, 18).

As a young state building a new capital, the service sector is undertaking construction projects worth 20 billion INR. Within the building plans are both public and private offices and housing projects. Direct increases in material demand are expected, as cement and steel are required in higher volumes, and providers that need additional workforce. The IT sector is promising as an essential part of the modern infrastructure needs. Specific

numbers, however, have not been disclosed. Tourism has a significant scope, with five-star hotels in Tirupati and Visakhapatnam (Government of Andhra Pradesh, 2017, 4).

Sector	Item	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Agriculture	Value (INR)	94008	111864	128956	148196	172531	207881	252847
	Growth rate %		18.99	15.28	14.62	16.42	20.49	21.63
Industry	Value (INR)	112660	101687	107408	124282	133322	145150	164482
	Growth rate %		-9.74	5.63	15.71	7.27	8.87	11.94
Services	Value (INR)	143086	165925	190359	215230	246129	281711	320380
	Growth rate %		15.96	14.73	13.07	14.36	14.46	13.73
Gross sector value added	Value (INR)	349753	379477	426722	487709	551982	634742	735709
	Growth rate %		8.50	12.45	14.29	13.18	14.99	15.91

Table 1. Gross Value Added at current prices (Government of Andhra Pradesh, 2017)

To uphold the growth, Gross Value-Added numbers monitored carefully, to implement strategic changes as required to avoid economic slowing. Table 1 shows an overview of the Gross Value added in Indian Rupees and growth rate in percent (Government of Andhra Pradesh, 2017, 5). While growth is present in all sectors, industry growth rate is slower than desired.

The Annual Survey of Industries (Government of India, 2016, 1) investigates the problems and opportunities in the economy of Andhra Pradesh, by examining the per sector performance. As a primarily agricultural state, the manufacturing segment of the industry sector lags the national average in GDP contribution of 15%, by contributing only 12%. The main products of the sector are food processing, pharmaceuticals, mining and metals, machinery and equipment, chemicals and textiles. The manufacturing sector is centralized in the cities of Visakhapatnam and Chittoor, which receive 56% of all investments. The problems hindering industrialization in the state are:

1. Lack of key infrastructure and related services available to establish manufacture
2. Current manufacturing sector is made up of small enterprises with labor-intensive work done by low skilled, low productivity employees.
3. The third of all manufacturing outputs is made by unregistered industries
4. Limited diversification and low adoption of technology

Problem tree for industry and trade

By using the problem tree (figure 2), the Andhra Pradesh government can present all factors within the state manufacturing sector visually. The tree divides into three main components: 1. Causes, 2. Core problems and 3. Effects

1. Causes

The lack of urban, transport and industrial infrastructure pose a threat, as the investments by the public sector have been insufficient to meet requirements, which would allow investments from the private sector. While land potential and capacities exist, the poor development and efficiency of local agencies hinders progress to meet the requirements. One of the reasons for poor efficiency lies in a lack of standards and guidelines, making business processes more complex. This is impeded by the overlap of governmental regulations and manual processing activities. Once the root causes are solved, the investor faces a lack of local skilled workforce and lack of institutions, which train them. Once the requirements for skilled workforce, good infrastructure and streamlined processes is resolved, manufacture on a larger scale can develop (Government of India, 2016, 5).

2. Core problems

As the core causes are identified, the problem is labeled as “*Constrained growth and competitiveness of the manufacturing in Visakhapatnam-Chennai Industrial Corridor*”. Although a broad statement, it covers the key effects in the sector, growth and competitiveness. Once the causes are identified and labeled, they can be directly linked with why the manufacturing sector has low GDP participation (Government of India, 2016, 5).

3. Effects

The effects troubling the existing manufacturing sector are identified within the three effects of the problem tree. Low manufacturing output and low GDP of the state, low productivity and poor employment opportunities and, increase of pressure on existing infrastructure. When comparing causes and effects, the lack of skilled personnel affects the low productivity and manufacturing output, which results in longer production times and smaller productivity. The lack of investments creates additional pressure on the existing infrastructure as well as less employment opportunities (Government of India, 2016, 5).

To resolve these problems, the government has developed an industrial policy program through which they plan to raise the GDP contribution of manufacture to 15% by 2020. Through additional funding and improvement initiatives in the business environment, the contribution will cover skilling, gender gap closure, and infrastructure improvement. Although the details are not disclosed, the six points address the main causes of the problem tree, which need to be resolved. A single desk policy is deployed, which aims to provide clearance for new operations within 21 days of submission. Special economic zones are planned which will provide economic benefits to investing companies. Registration of unregistered firms will be undertaken to reduce the informal sector in the state. Steps include the fundamental operations of starting, operating and closing businesses, project development activities and industrial infrastructure projects. Skills for the sector will be developed with the support of the private sector through the assistance of APSSDC and the National Skill Qualification Framework. Several target sectors are identified, where specific policies will be implemented to attract investments and employment: Car component and car manufacture, biotechnology, textiles, aerospace and defense, food processing, leather, marine and aqua and micro, small and medium enterprises (Government of India, 2016, 3).

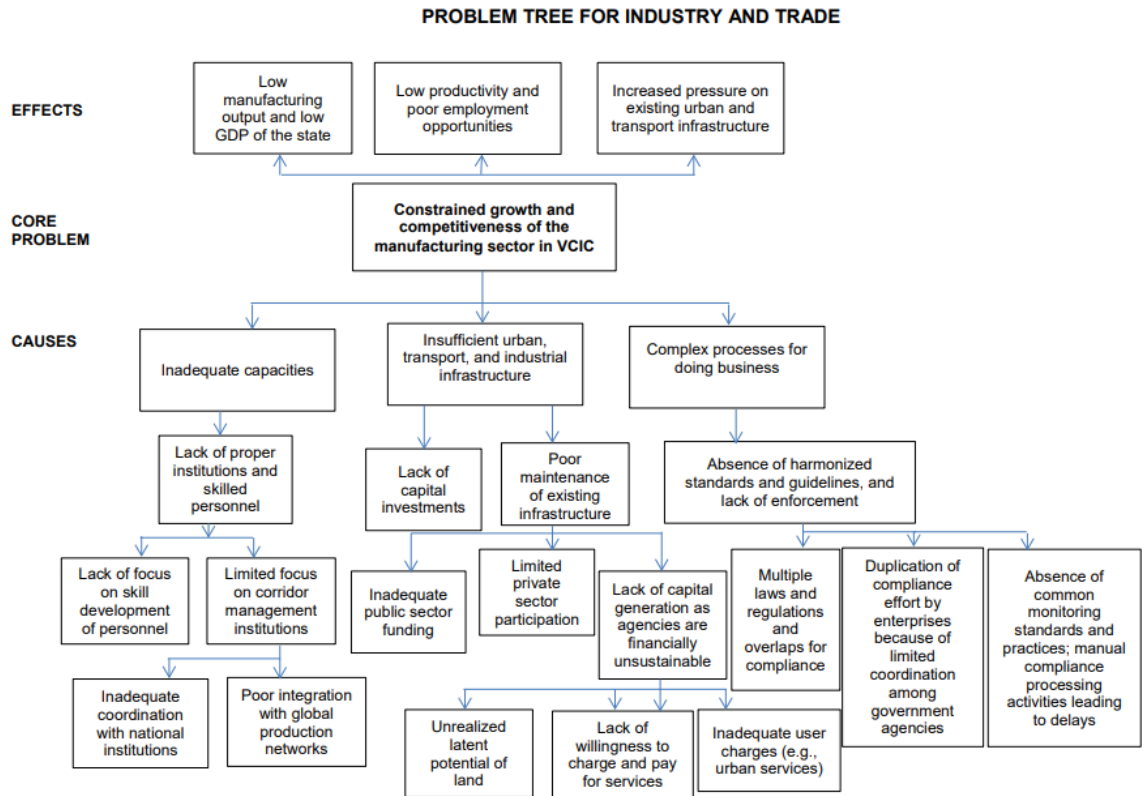


Figure 1. Problem tree for industry and trade (Government of India, 2016)

3.1 Education in Andhra Pradesh

The educational system across India consists of 10 years of primary and elementary schooling, followed by 2 years of junior college. In Junior college, the students learn technical or vocational professions, which serve as the first two years of undergraduate (bachelor's degree) studies. Education is free and compulsory for all children aged between 6 and 14 for the grades 1 to 8. According to the 2011 census of India, the literacy rate in Andhra Pradesh state is at 67.35%, lagging India's average of 72.98% (Government of Andhra Pradesh, 2017, 9).

One of the fundamental problems that arise especially in rural areas is students deciding to not continue their studies - dropouts. Some of the recognized issues include poor facilities, inconvenience in transportation and family pressure. In many rural cases, the student's families discourage studies in favor of labor, with the parents having dropped out of formal education in their youth as well. The primary school dropout rate in Andhra Pradesh was 4.35% in 2013-14, while dropout in 2014-15 was 6.72%, an increase by

2.37 percentage points, with 92.8% completing primary education (grades 1 to 4). During secondary studies, the dropout rate increases, but does not show a clear trend or consistency throughout the later grades. In grade 5, 92.5% complete their studies, in grade 6 94.3% complete their studies and in grade 7, 89.3% complete their studies. However, the national average trend shows improvement with an average enrolment increase from 84.5% in 2005/06, to 98.3% by 2014/2015 in primary education studies. Although the dropout trends are slowing down in primary education, all education following primary still struggles with dropout rates, which while are lower, are still significant for the individuals who end up without any professional education (USAID, 2011, 10).

While school attainment is reaching comparable levels as developed countries, the quality of education requires improvement. Quality in education is critical to provide effective development and sustainable growth, for both the economy and the society. In India's example, commitment for improvement is most visible in the increase in education spending between 1997 and 2013 (Table 1). With the annual average dropout rates decreasing, an overall increase of literacy from 62.07% in 2001 to 67.35% in 2011 and increase in graduate examination pass from 63.92% in the academic year 2000-2001 to 91.92% in the academic year of 2016-2017 (Government of Andhra Pradesh, 2017, 5).

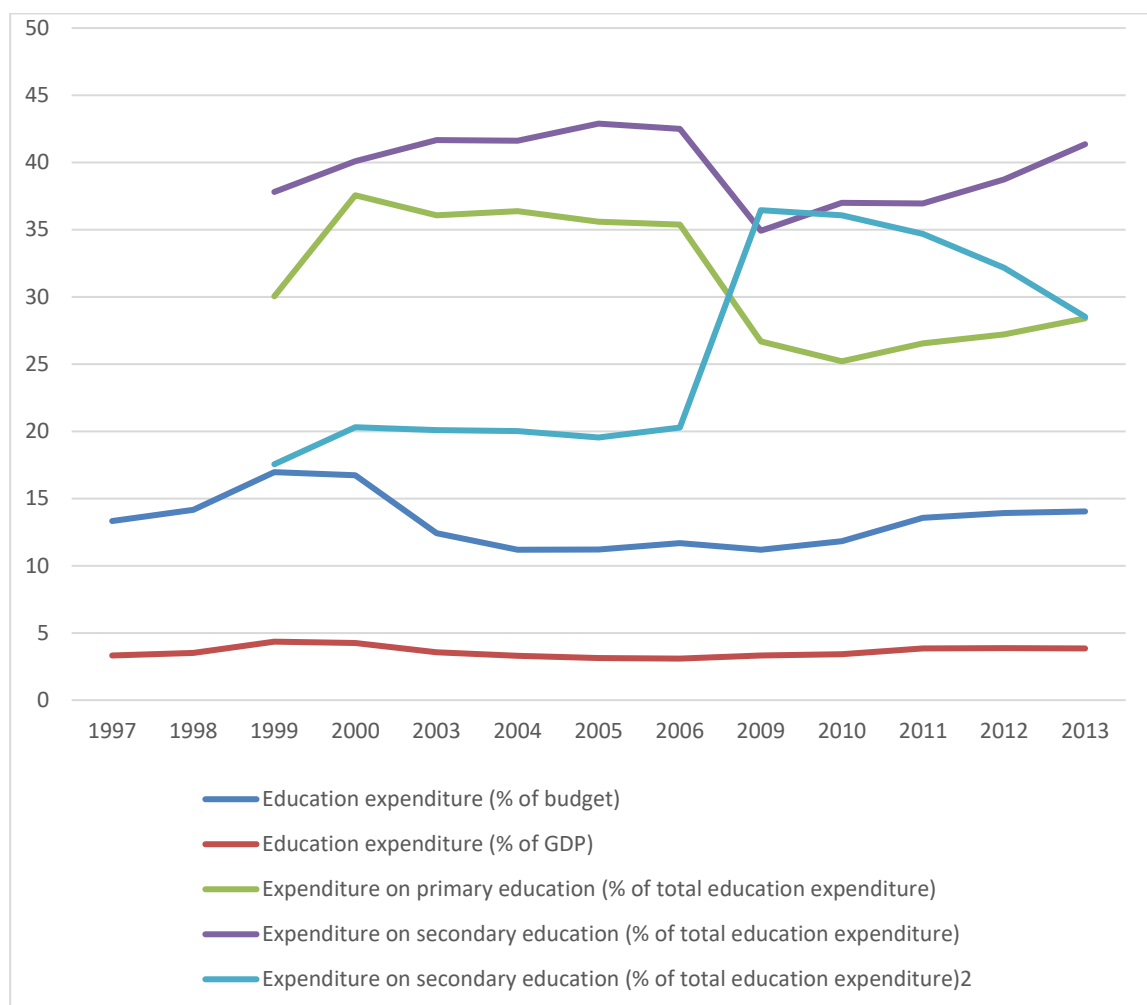


Table 2. Education expenditure in India (UNESCO, 2018)

Andhra Pradesh has 6,961,000 students enrolled in classes 1 through 10. Currently, 84,917 students are enrolled in government higher degree institutions and 126,753 students in private higher degree institutions, 211,670 students who continue with higher education towards a bachelors or masters' degree. To fill the skill gap between the economic growth rate and available skilled workforce, APSSDC deploys skills development programs to 500,000 participants annually. In cooperation with corporate partners Siemens and Google, the governments trains and employs workforce for technical positions within their local corporate branches, 23,000 placements have been made so far. The most notable skill development programs include cyber security, data analytics, programming and accounting for degree holders and higher education students. In addition to providing degree level courses, APSSDC has craftsmen and vocational training programs to allow both dropouts and those with limited or no education to obtain work-life skills (Government of Andhra Pradesh, 2017, 243).

Craftsmen training scheme

This program provides employers with a steady flow of skilled workforce in a range of trades based on the workforce requirements. Through this program, the government may react effectively to qualitative and quantitative changes in each industry. Andhra Pradesh currently operates 79 such industrial training institutes (Government of Andhra Pradesh, 2017, 243).

Vocational Training Improvement Project

The purpose of the Vocational Training Improvement Project (VTIP) project is to provide machinery and equipment training to individuals in a similar manner as craftsmen training scheme and according to the syllabus and demand of the industry. The central government and the World Bank funds this project. The training is deployed through 19 industrial training institutes (Government of Andhra Pradesh, 2017, 243).

As an important element, one must consider the cultural differences that may arise when doing business with foreign parties. India is a high context culture, meaning that thoughts and ideas may not be expressed directly, and one must understand the indirect implications of a sentence, body language, and tone to fully understand the message. As such, the development of a business and relationships take longer than in western societies, with a slower flow of information, longer and less effective meetings and requires patience (Terence, 2017).

3.2 Game development summer school

Before the implementation of the summer school, KAMK and Andhra Pradesh government needed to negotiate on the precise terms of how the summer school will be facilitated, each sides responsibilities and financial matters. The government of Andhra Pradesh requested a detailed proposal to be sent by KAMK detailing the project. The document titled "Proposal for India Game Development Challenge (IGDC)" was drafted in April of 2018. The proposal contained 54 pages, defining the project process, teaching methods, the student's deliverables, infrastructure requirements, pre-requisite knowledge, an overview of the game development industry market and options for expansion and future courses (KAMK, personal communication, April 15, 2018).

3.2.1 Contents of the project proposal

Below is an overview of the main points of the proposal. The local government elected APSSDC to be the direct organizer of this program and all negotiations will be conducted between KAMK and APSSDC, with EDB approving the finalized agreements.

Executive summary

The executive summary contains an overview of the proposal. In summary, the course contents are defined to clarify the European Credit Transfer System (ECTS) including the reasoning of awarding 12 credits to course graduates. The total course duration is 8 weeks, with premises being available on Saturdays, allowing for more flexibility to how students work on their projects. The course is designed to encourage critical thinking and the teams' independent work, with the coaches providing support where needed.

Gaming – rising sun industry

The gaming industry has been popularized through mobile gaming in recent years, attracting more casual players to play games on their smartphones. As India is a mobile-first market (preference for smartphone ownership over a computer), course emphasis will be to teach game development for the mobile platform. Within mobile game development, developers need to understand revenue models and the platform for which they will develop Android or iOS. Revenue models for the end user feature purchase of the game, the free models featuring advertising and transaction-gambling models.

Target group and prerequisites

The course target group are individuals who have studied or study in a computer science field. The minimum age is 15 years, with consent needed by a parent or guardian. As APSSDC has a substantial network of offices and employees over the state, recruitment was made directly with universities and employment offices to identify the best candidates. For students who wished to participate as a graphics artist, experience with Photoshop, Krita, 3DSMax or Blender is required. The limited time for the course did not allow for a big learning curve of new tools.

Pedagogical approach

The course was project based and the flipped learning approach, proving to be a significant change to how students in India experience learning traditionally. By providing al

materials and resources at the beginning of the course, students had the opportunity to examine and revisit all materials as needed. The teachers and students from KAMK were available to students and provided advice and help in solving problems in the development. At the beginning of the course, ad-hoc lessons were held to help students connect the different roles and form teams.

Course curriculum

The course curriculum provides important dates and times for course participants. Starting date and ending dates are preliminarily defined for the clients' (APSSDC) consideration. Proposed dates were set for June 4th for course beginning and July 27th for course ending. The game development summer school course is an adaptation of KAMK's course titled "Developing a Commercial Game Application". As many of the local participants have not experienced game development work or studies, additional lectures and individual coaching sessions were added, allowing them to understand the main concepts of the course more rapidly. General examples are monetization of games, platforms, genres, mainstream engines, tools, and resources. As classroom lectures are minimal, students learn from the course materials based on their role needs. All students were required to study business operation models, financing in the game industry and basics of game marketing. Every second Friday, students presented their development progress within a set 3-minute period, to teach them to focus on facts and low context in presentations. At the end of the course, students held a 10-minute presentation showing their final progress. The course was graded as pass or fail, and the main criteria was the playable demo of the game, as presented at the final presentation.

Game development resource

Each role within the team has specific software tools needed to develop the game. The tools that are shared between all team members are productivity and communication tools such as Slack, Trello and Google Drive. Other notable software used is the game engine, where the code and graphical assets are utilized to create the visual style, physics, rules, story, sounds, and mechanics of the game. Within the proposal, KAMK listed the required software for each role, including free tools and alternatives for each program and use case. Ahead of the course start, KAMK teachers and students compiled a detailed list of resources and knowledge for each of the roles in the team. Students were able to find instruction on how to use programs, avoid common mistakes, present their game to a live audience and how to label it in terms of genre and style.

Project budget

Before the budget proposal and costing, research was made to compare alternative offerings provided by other European and North American institutions. From the examined 14 institutions, the average pricing was found to be 1053€ with the average course duration of 14 days. The listed price determined to be too high while the course was proposed to be 8 weeks or 40 days. A breakeven point was reached with a participation fee at 500 students, and negotiations continued from these numbers to reach a profitable solution. KAMK drafted a budget defining all costs and expenses required to carry out the program. Contents of the budget included only KAMK's costs, such as salaries, flights, accommodation, planning, local travel, purchase of hardware and travel documentation. In a budget meeting with APSSDC, the budget was finalized, and the project contract was signed.

Intellectual properties

KAMK has stated that it does not take any stake in the developed materials or the game that will be developed in the summer course. APSSDC decide to take a minimal stake in the product with a commitment to support the most promising games and team for further development. The majority stake of the game and any assets belong to the individuals or team that created it, as agreed by them internally.

Project confidentiality

The specific course content was made available to all students and staff to freely study during the summer school period. Budgetary numbers are considered confidential. It was agreed that final numbers or documents would not be shared outside the signatories of the MOA or any other signing party.

Future steps

EDB, APSSDC, and KAMK agreed that the successful conclusion of this pilot project would translate into further educational projects. The project may be expanded and offer more courses to a greater audience. Courses should be available at more flexible times throughout the calendar year. The aim of the project is to encourage entrepreneurial activities, provide skills required for employability and possibilities to join internship programs.

During the first visit of the delegation, EDB invited the Finnish universities to consider opening local branches or to provide their study programs in cooperation with local universities. In the proposal, KAMK included that once the first summer school is successfully completed, it will be open proposing a study program facilitated with local partners for providing education through e-learning and in-person teaching programs and an option to provide study places to students to study and graduate from KAMK, Finland. As KAMK University is part of the *European Credit Transfer System (ECTS)*, credits gained through the courses held in India by will be awarding ECTS, which may be redeemed in European universities.

Once all terms were agreed, a Memorandum of Agreement is written, in this case, drafted by APSSDC and distributed amongst the other parties, EDB, KAMK and SRM University.

3.2.2 Memorandum of agreement

Once the proposal is submitted, the client party, in this case, APSSDC, carefully examines the contents of the proposal. Within the contents, the client confirms that all details are as agreed in negotiations. As no changes were necessary or outside of the initial agreements, preparations began on drafting the Memorandum of Agreement (MOA). APSSDC requested to be the MOA drafting party, carefully structuring the terms of the project, sharing draft versions between parties until the final paper is approved by all signatories. This memorandum serves as a binding contract between the four parties and defines their roles within the project:

Andhra Pradesh State Skill Development Corporation

APSSDC is the project owner, tasked by the Economic Development Board to facilitate higher learning studies in cooperation with KAMK. The role of APSSDC is to enroll 500 students from Andhra Pradesh universities, cooperate with SRM on accommodation preparations and to monitor the course implementation by KAMK. Students will be recruited based on the predefined prerequisite knowledge provided by KAMK. Accommodation will be arranged on the new SRM campus in Amaravati, where the program will be implemented. Monitoring and reporting will be shared internally amongst Andhra Pradesh governmental institutions.

Kajaani University of Applied Sciences

KAMK is the academic partner in the project, organizing teaching through its own methods. As such, the established project course methods will be replicated onto the Indian Game Development Challenge 2018 summer course. The students will be instructed on how the course is implemented, assisted to formed teams and guided throughout the whole period. Ad-hoc teaching will be organized at scale to assist on the most common problems throughout the course time, as required. Course graduates will receive 12 ECTS credits.

Economic Development Board

EDB is the governmental body responsible for strategic planning of development, including investment planning, promotions, internal governmental coordination, and research. EDB has initiated the project and tasked APSSDC to negotiate terms and implementation. EDB will be one of the recipients of the project report.

Sri Ramaswamy Memorial University, Andhra Pradesh

Sri Ramaswamy Memorial (SRM) University is one of the new universities established in the future state capital, Amaravati. SRM provides the infrastructure, including approximately 150 computers through 6 classrooms, accommodation for students and teachers and a cafeteria with 3 meals a day.

The full Memorandum of Agreement contains twelve pages and more details on each of the partners role within the project. Due to the confidentiality of the terms and figures mentioned, I am not able to share beyond the facts written above.

3.2.3 India Game Development Challenge 2018

During the summer of 2018, KAMK deployed project studies in game development to 500 local students and participants of APSSDC skilling programs in Andhra Pradesh State, India. The course ran from June 4 until July 27, lasting for 8 weeks. The pre-requisite for joining was to have studies or currently studying in a computer science field. The reasoning for such requirements is the previous knowledge of programming, graphics and modeling tools or, office productivity tools. Based on their knowledge, the students were given the role of programmer, graphics artist, producer or designer.

Participants were divided into approximately 10-member teams with all 4 roles present to work on developing commercially viable games. KAMK sent 10 persons, 2 teachers and 8 students to the location to assist and coach the participants. The 8 students were chosen based on an interview with their accompanying teacher and by approval of the head of school. The venue for the course was at SRM University, Amaravati. By the end of the course, 46 games were developed of which 10 were immediately published commercially on the Google Play store for smartphones. It is important to note that these published games are only demos of the games. It is the participants' own choice to decide if they wish to continue the development of the games. In previous project studies at KAMK, teams decided not to continue work on these demos and commit to a new project for the next course. In any case, the teams in India will gain experience by publishing their game to understand the process from prototyping, development, publishing and user feedback, participating in the whole cycle. As part of the final presentations, a competition was held to award the best team with an all-paid visit to Slush Finland. The winning team, Incendium, developed an "endless runner" type of game and its six members visited Slush Helsinki in December of 2018.

With the conclusion of the project for the summer of 2018, both parties continue negotiations for future educational projects. Factors for consideration are the limitations of infrastructure regarding scalability. KAMK proposes a series of online courses ahead of the summer school studies. Independent studies allow students to examine the industry concepts and decide on a specialization ahead of the summer course. Once completed, students contribute based on their chosen specialization. The included courses are *Introduction to game development*, *Basics of graphics*, *Basics of programming*, *Basics of production and design*, *Advanced graphics*, *Advanced programming*, and *Advanced Production and Design*. Each course contains tasks and exams to evaluate their progress.

A proposal consisting of course descriptions, a timeline of teaching and finances has been delivered to the government for consideration. As the proposal review takes place in Andhra Pradesh, I begin the distribution of a questionnaire to gather opinions of the educational activities and expansion possibilities.

4 PORTFOLIO EXPANSION RESEARCH

To provide accurate service offers to the partners in Andhra Pradesh, it is important to conduct research beyond the statistical reports published by the state and assess the public opinion on the matter. An important consideration in publishing questionnaires is the cultural differences and comprehension of questions, to ensure the reliability and viability of the responses. Access to an alternative source of information besides the publicly available reports (Government of Andhra Pradesh, 2017) provides a personal aspect of educational circumstances. As the data available reports are comprehensive, conducting qualitative research provides the author of this thesis with confirmation that the government strategy for employment and industry needs align with the public's ambition in schooling.

The research questions are designed to offer insight into the societal preferences and employment needs, while reassuring that the outlined industry plans of the government (Government of Andhra Pradesh, 4) are translated into the accurate development plans of the new state of Andhra Pradesh. Qualitative research allows for more free form answers and provides room to the respondents to provide opinions from alternative perspectives from what the researcher sees. In the case where the researcher is from a foreign culture and country, the domestic point of view paired with a foreign one allows for both an insiders and outsiders perspective.

4.1 Choice of research method

Data to examine current employment and education is available and has been used in this paper. However, as the state runs significant development projects, past data is insufficient to predict the human resource needs. For that reason, the method chosen is qualitative research through the distribution of a questionnaire to a target audience. Qualitative research allows respondents to elaborate their answers in a creative way, encouraging both praise and criticism in their responses. Through free writing, the respondents can describe and express their opinion freely and with context (Corbin & Strauss, 2008, 347).

The questionnaire is distributed specifically to individuals who have worked or participated in KAMK's 2018 summer school in India. The participants have experienced the

flipped classroom learning method for the first time. A world where teacher and students are equals was a new circumstance, leaving the participants bewildered. Furthermore, the questionnaire participants are comprised of various degree students, graduates, re-skilling program participants and employees of the skilling organization who now underwent the two months of studies, without constant lectures and in unconventional relationships with the course teachers.

4.2 Design of questions

Twenty-two questions were created (appendix 1) for this research. Google forms were used to create and collect questions. Once responses are given, they are automatically collected in Google Sheets. The questions were designed to provide descriptive answers on the perception of higher education needs in Andhra Pradesh state. An important element in both written and oral communication is the difference in comprehension of the English language between the cultures of the researcher and the respondent. Therefore, this questionnaire was newly written, and although some questions are standard, they were selected with clarity and comprehension for the respondent (Harkness, Vijver, & Mohler, 2003, 49). Due to the respondent group being chosen from the participants of the summer school, it is expected that they are biased towards the KAMK course and that favoritism towards game development education and the Finnish type of teaching will be favored.

Groups of questions were designed to provide information on specific areas:

The first two questions determine the gender and age of the respondents. The questionnaire was distributed at random amongst the participants, no selection based on gender or age was made prior to sending.

Questions three to seven ask about the students' birthplace and language proficiencies. Two main reasons for this set of questions: firstly, a part of the students who participated in KAMK's summer school did not understand or speak English, with Telugu being the official state language. Secondly, to determine preferences in education and the motivation towards migration or immigration in the future. Furthermore, language questions help identify the students' comprehension and preferences in studies.

The next set of questions examines the students' current degree studies and the level of education of their parents or guardians. As parents often create academic pressure or

discourage studies, influenced by their own upbringing. Therefore, this set of questions will observe the correlation between engineering studies and the level of education of parents. Understanding the education preferences in relation to their parents, it is easier to identify target customers for certain programs.

The last set of questions is created to allow respondents to provide feedback on their personal experiences in education. Questions in this set ask the participant to elaborate on quality of education on Indian and Finnish programs. Respondents are asked to provide feedback on current employability opportunities for degree holders and provide a prediction for job needs in 10 years. The last questions ask the respondents to elaborate on the biggest problems and the biggest positives in education to better understand how to differentiate the offering from KAMK.

4.3 Distribution and collection

Respondents were chosen at random from the pool of 500 participants of KAMKs summer school program. As they had experienced the difference in the delivery of teaching, they were relevant respondents for comparisons of teaching and ability to provide elaborate free form answers. Although the questionnaire was distributed to a target group of people, the responses did not collect personal information beyond demographic data. The chosen group of respondents allowed for higher data validity and general comprehension of the questionnaire content. The questionnaire is expected to receive a limited amount of responses, which represent the approximate opinion of the larger group. This sample size is considered a sample size of opinions within the Andhra Pradesh state. Further research using qualitative methods can be done once further projects have been completed to expand the sampling frame. It is important to highlight that unlike representative research, this questionnaire does not factor in the economic, social or demographic background of the respondents to create representative data, but instead targets a pre-existing group based on the project involvement (Harkness, Vijver, & Mohler, 2003, 406).

Once the preparatory stage of the research was completed, the questionnaire was distributed to the target audience. During this stage, the overall concept of the research is defined to set expected timeframes for the process (Figure 2).

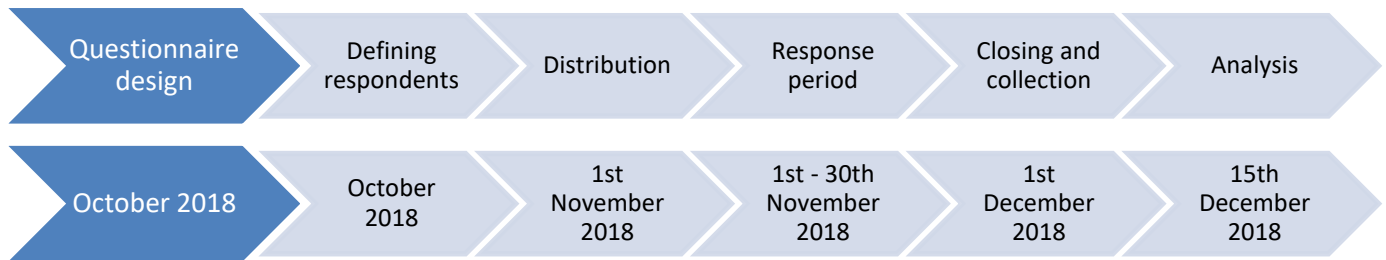


Figure 2. Research timeline

At the time of questionnaire distribution, the target audience received information on the purpose of the questionnaire. The questionnaire was distributed via email addresses provided by participants during the summer school. A thirty-day response period was set during which respondents can reply, ask questions regarding the research or provide comments. Once the response period ended, the replies are sorted and examined for validity.

5 ANALYSIS OF RESPONSES

Findings of this study are used to compare public opinion against the governmental strategy. As qualitative research, the primary purpose, however, is to gain an understanding of the culture regarding education. As Finland and India are dissimilar cultures, understanding beyond statistical facts is needed. Qualitative research allows questions to be formed easily and understandably, while providing accurate and understandable answers.

5.1 Study of responses

1. What is your gender/sex?

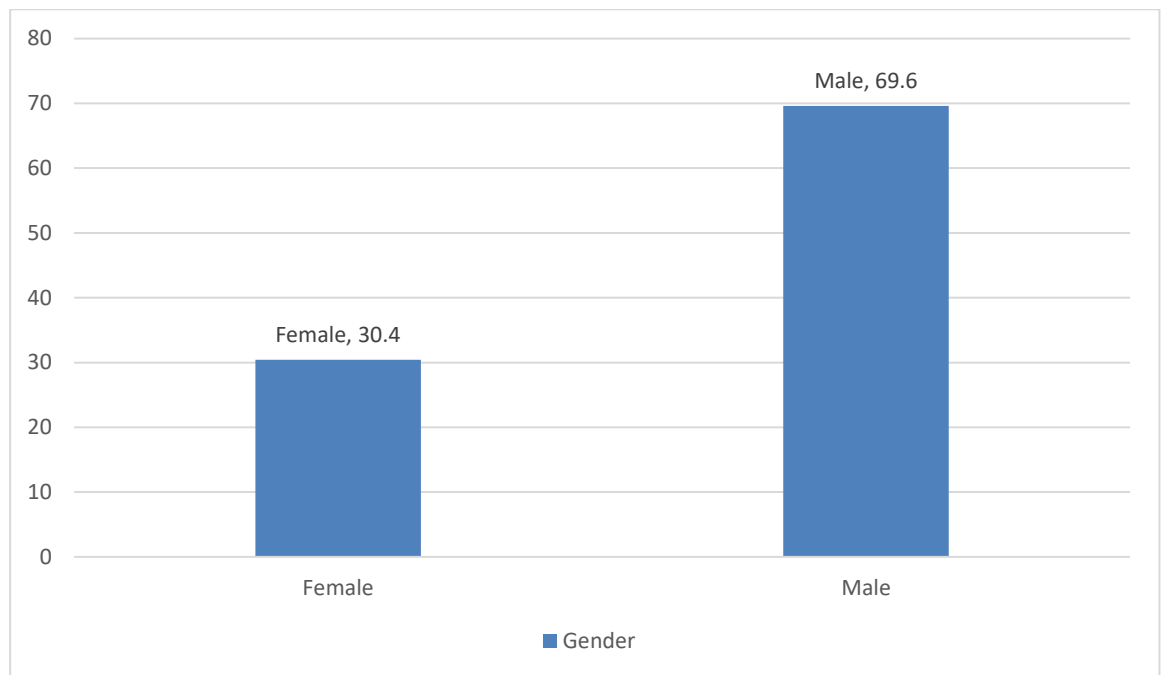


Table 3. Gender of questionnaire respondents

The gender ratio of respondents is comparable to the gender ratio of the IGDC participants. The exact ratio of participants was 32.9% female to 67.1% male.

2. What is your age?

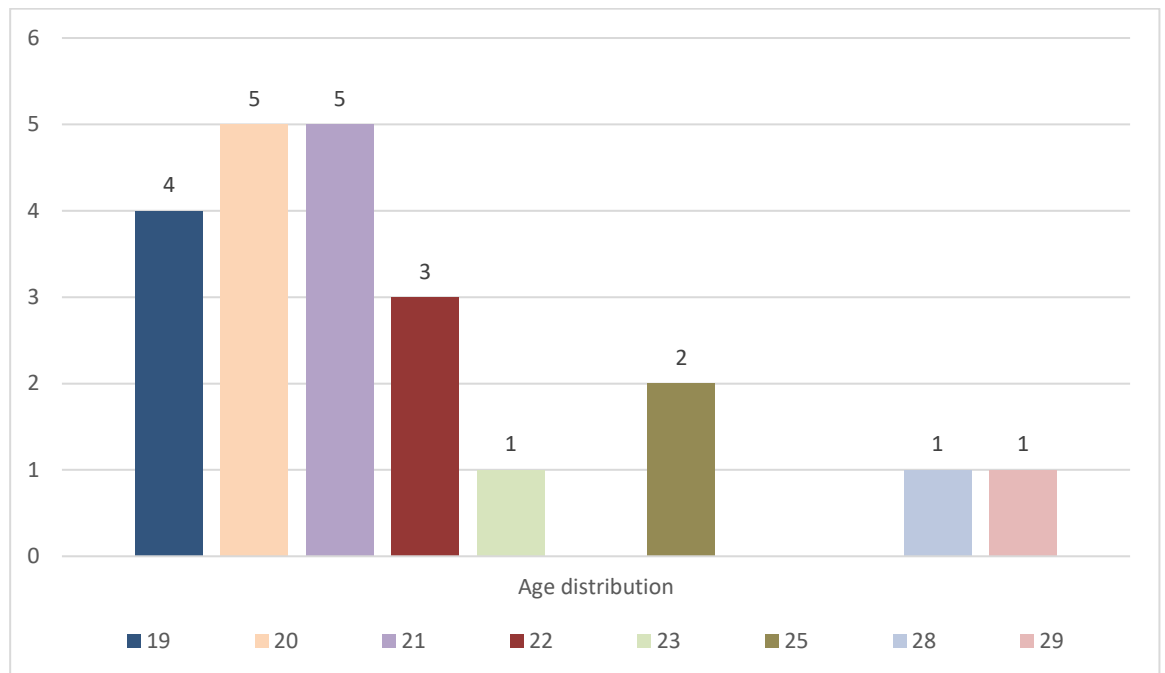


Table 4. Age distribution of questionnaire respondents

As this questionnaire was completed anonymously, it is not possible to determine the respondents' age and current employment or study status. As all participants were university students or government employees, the assumption which can be drawn is that the younger age group, 19 years to 23 years is generally the age of university studies, while the age group of 25, 28 and 29 years can be considered as employment age after graduation.

3. What is your place of birth?

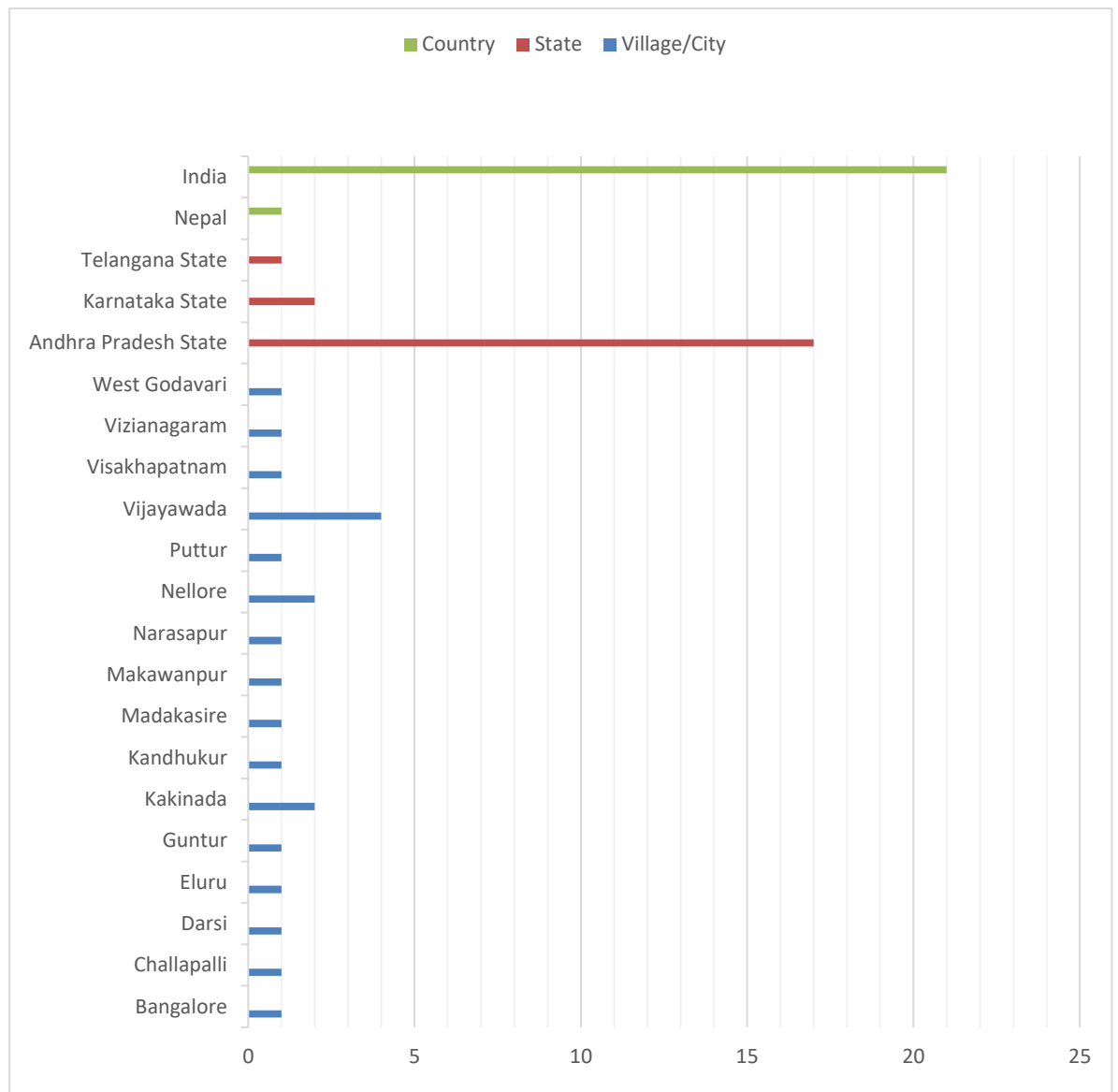


Table 5. Participants by place of birth

Majority of respondents are Andhra Pradesh natives, which allows for an accurate comparison in questions between local and outside education. Respondents from Andhra Pradesh come from the whole area of the state, allowing for a broader perspective of feedback to the questions.

4. What is your city of residence? (or nearest city)

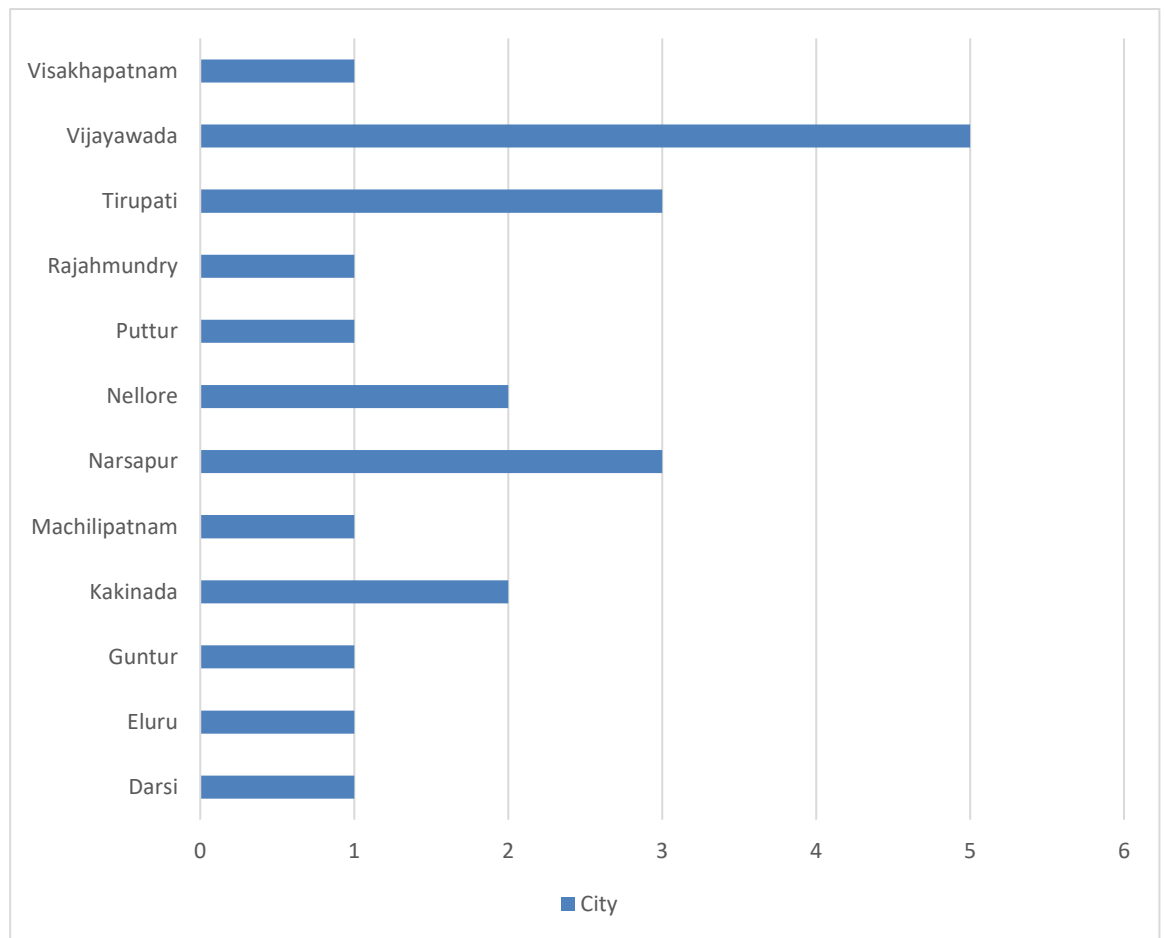


Table 6. Participants by place of residence

Most respondents reside within the larger cities of the state, or in close proximity of their university or workplace. No significant change is visible between rural to urban migrations. However, the commitment to join study programs away from home for 8 weeks was not difficult.

5. What is your native (first) language?

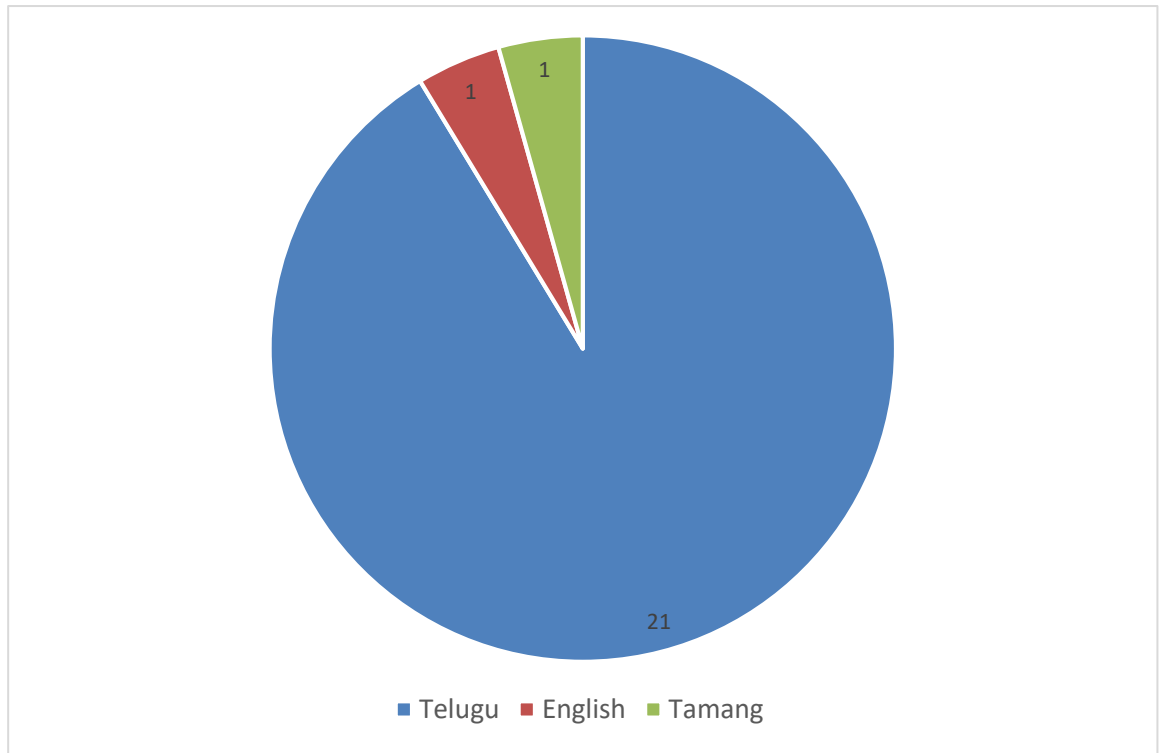


Table 7. Distribution of native languages of respondents

Majority of the respondents have told that the Andhra Pradesh and Telangana primary language is their native language as well. The Tamang language is the language spoken primarily in Nepal. The distribution of the languages is in line with state proportion of primary and secondary languages.

6. Which other languages do you speak?

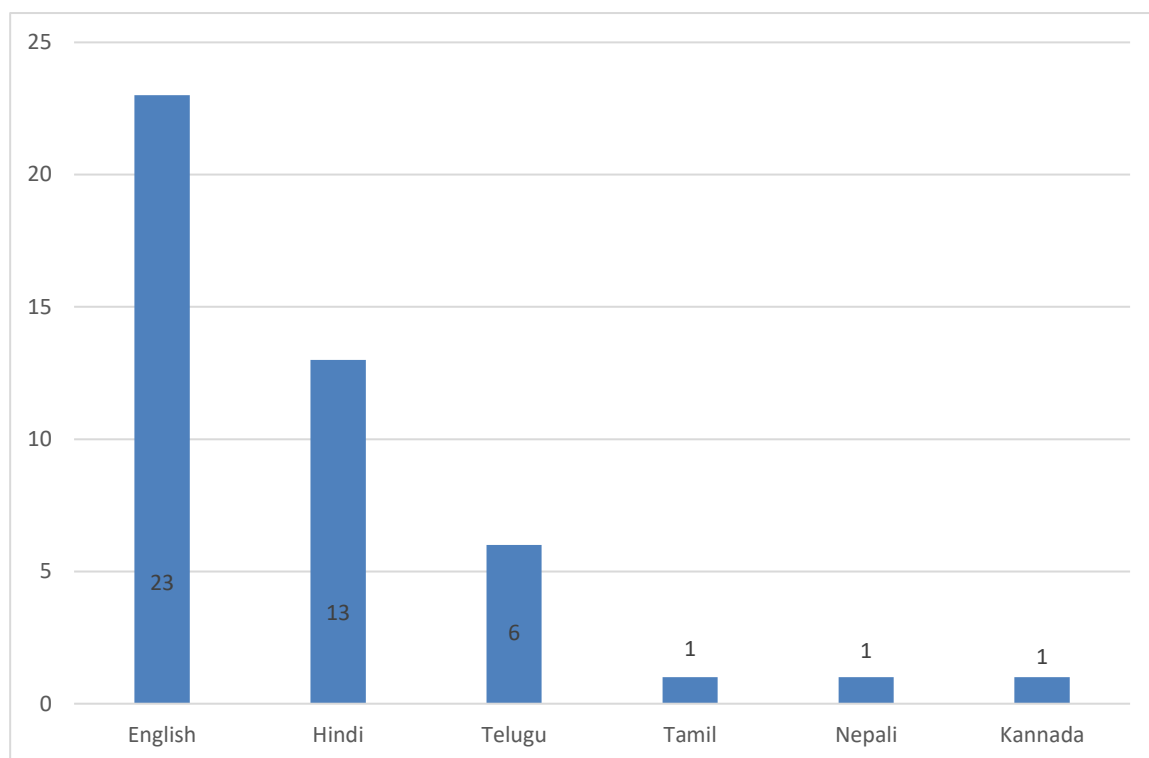


Table 8. Distribution of non-native languages

All respondents replied that they speak English as well, while more than half of the respondents at 56% speak Hindi as well. As there is no single national language in India, with many regions using their own languages, English is accepted as the nationwide language, although as a second language. Government and other official matters are written in English. Results show a higher preference towards a high acceptance of the English language as well as Hindi, which is primarily used in the northern regions of India. The high acceptance of English provides an important factor when teaching, as students will be able to adopt new materials and knowledge faster.

7. Which has been the primary language used during your studies?

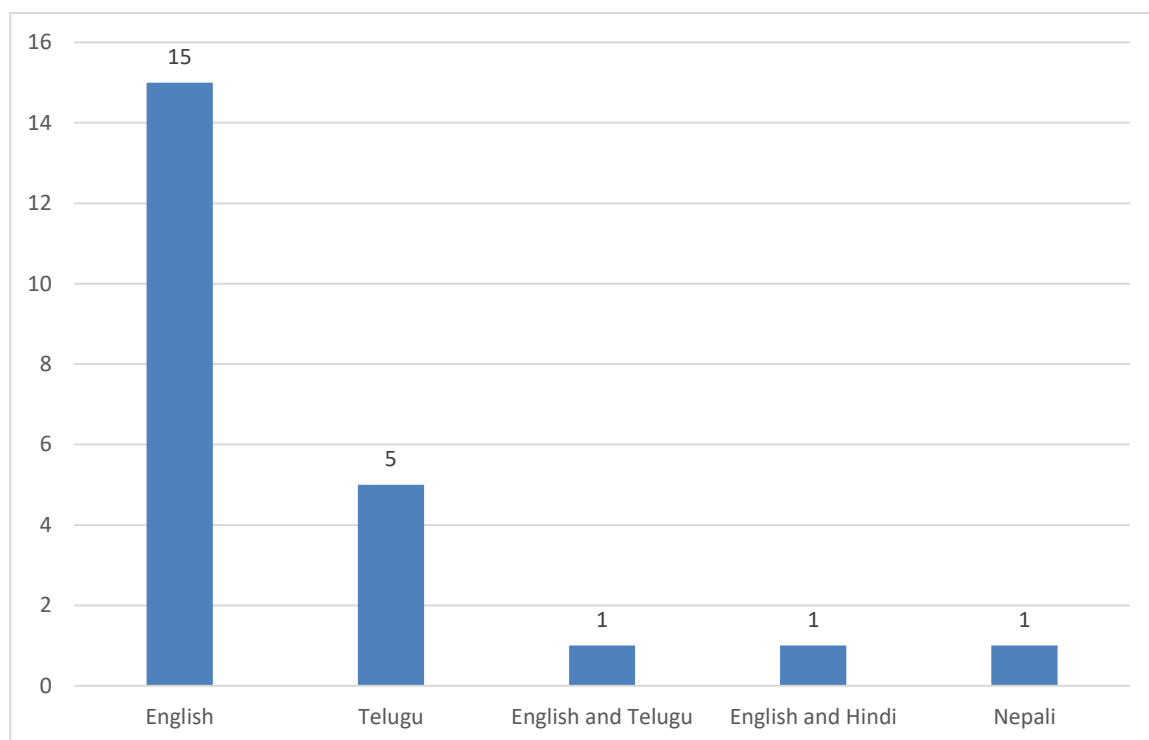


Table 9. Distribution of primary languages used in education

The proficiency in the English language is not surprising if considered that the majority of respondents have exclusively used English as their primary language in education. A high level of English comprehension allows foreign educators to communicate and teach effectively by using the English language with local students. The same is true when education and migration to foreign speaking countries are observed, allowing Indian students better integration due to a minimal language barrier.

8. If you could choose, which language would you choose for your studies?

English

23

All respondents have replied that they wish to have English as their exclusive language in studies. As Indian students are exposed to multiple languages daily, the communication with other individuals may be difficult on a daily basis. The desire to study in English, as the language adopted nationwide as the standard in formal and informal communication becomes clear. With greater adoption of English, the workforce becomes a more competitive cross state and internationally. This preference is in line with the planned teaching being in English.

9. What degree are you studying? (Or have you completed)

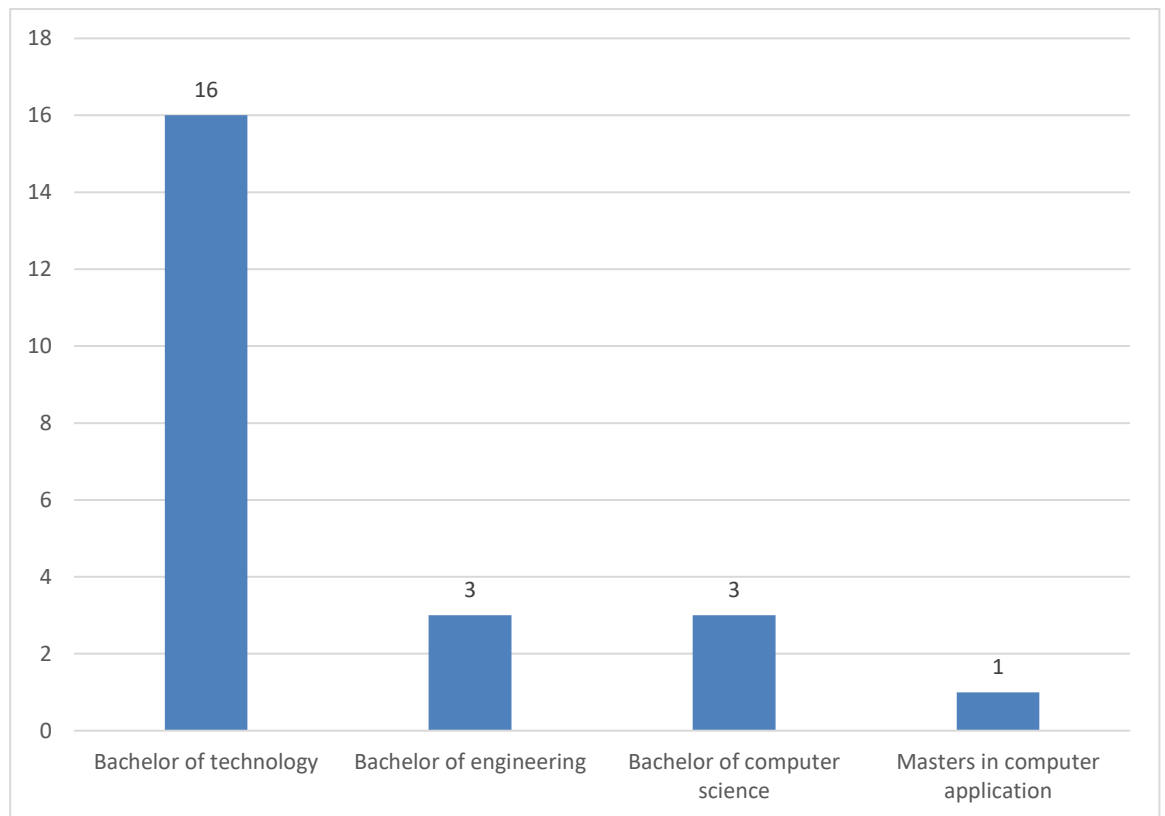


Table 10. Respondents' studies by degree

Majority of respondent's studies in Bachelor of Technology, a degree where students opt into studying computer science, information technology (IT), electronics and communications engineering, electrical engineering, mechanical engineering, civil engineering, petroleum engineering, chemical engineering, aerospace engineering, industrial engineering or aeronautical engineering. As such, a preference to join a software development summer school is in line with their studies in regard to development work. That indicates a high interest in computer sciences studies but does not offer insight into other fields with the potential interest of education export.

10. What level of education do your parents have?

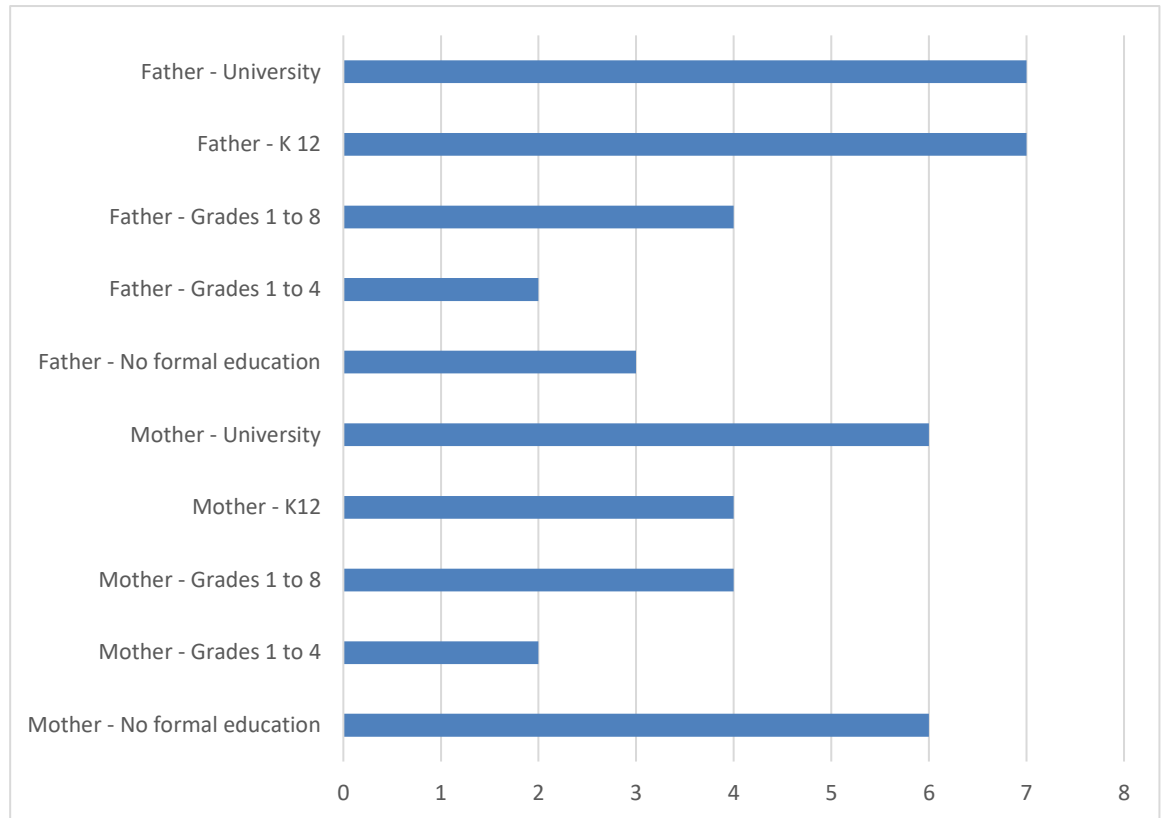


Table 11. Education acquired by the parents of the respondents

As academic pressure is high in India, it is not surprising to see that both genders of parents have at least completed eight grades of education. As mentioned earlier in this paper, parents with completed education are more likely to encourage their children to study longer and make decisions in their best interest.

11. Have you spent part of your studies or conducted your internship in a foreign country? If yes, please specify country and lengths of study

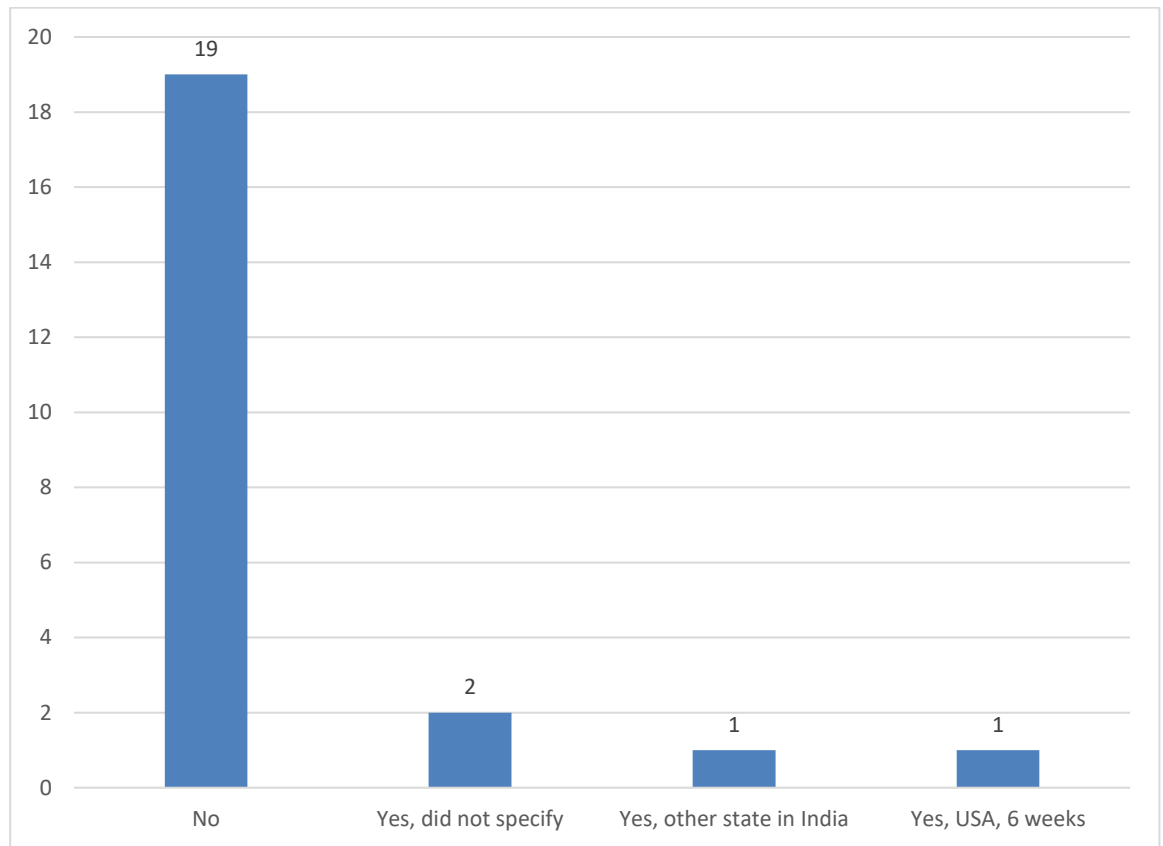


Table 12. Respondents who studied or had internship outside India

Most respondents have not experienced education outside India, meaning that unconventional classroom teaching methods are new to them. Adopting new methods and effective studying will require additional time. Although students express curiosity and motivation, comprehension of course requirements and goals need to be reviewed to ensure that students can succeed in the new learning environment.

In case you have studied or done your internships in a foreign country, please make the comparisons in questions 12 and 13 between Andhra Pradesh and the foreign country.

12. In your opinion, what is the quality of life in Andhra Pradesh compared to a foreign country (or rest of India)? On a scale of 1 to 10, 1 being worse and 10 being better.

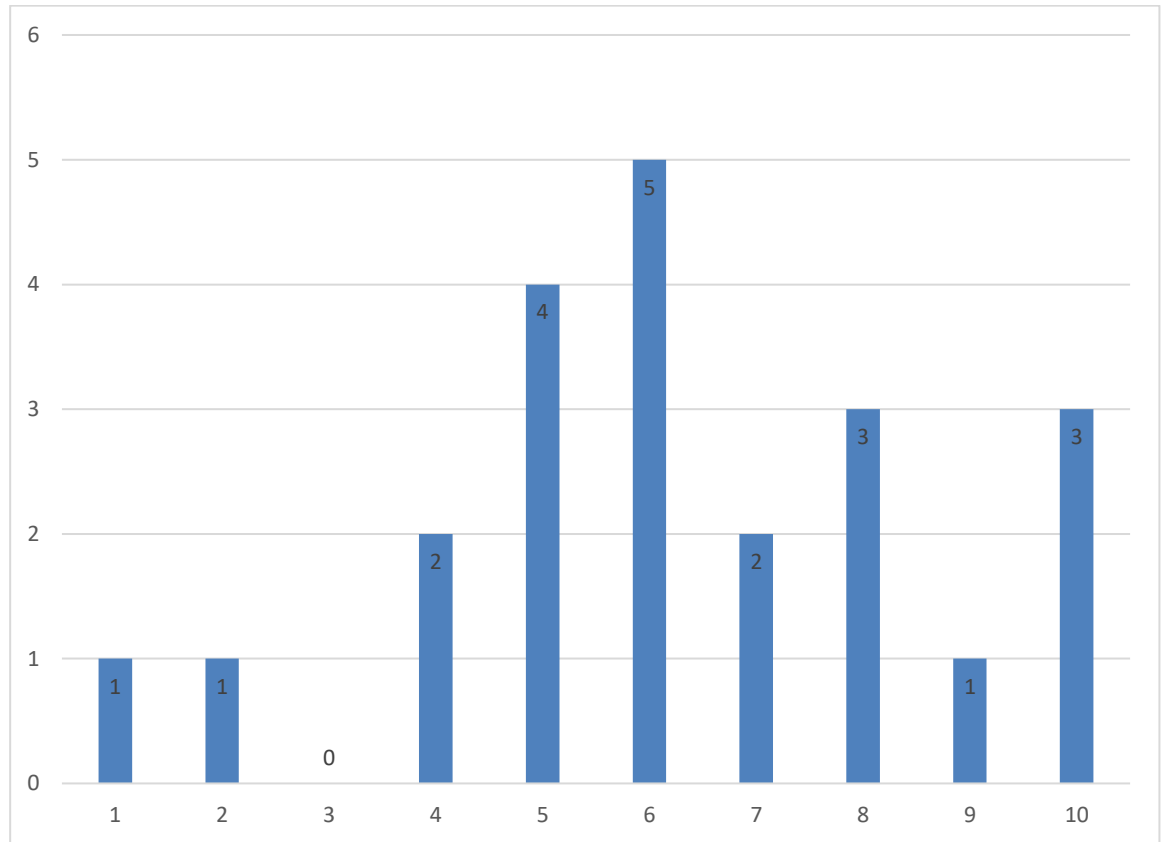


Table 13. Quality of life rating in Andhra Pradesh

The respondents' average score for quality of life is 6.04. Based on the responses, and current development projects, the quality of life is increasing. As the majority of voters have voted above the average of India (score of 5), the conclusion can be made that they are overall content with the current quality of life and the direction of development. Through the responses gathered in question 11, the observation is that respondents do not have visited a foreign country and it is concluded that comparison is made based on the perception of the world, rather than personal experiences.

13. In your opinion, how is education quality in Andhra Pradesh, compared to the rest of India? On a scale of 1 to 10, 1 being worse and 10 being better.

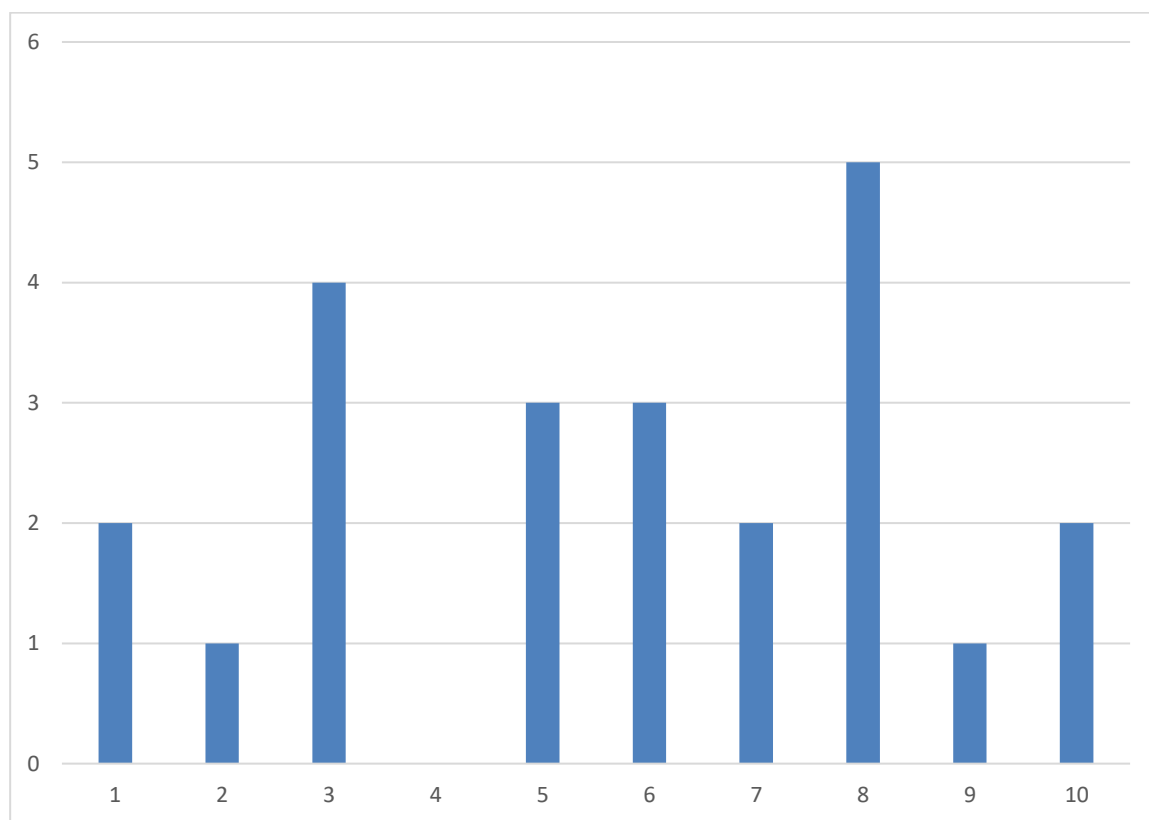


Table 14. Quality of education in Andhra Pradesh

With an average score of 5.73, respondents have rated the education quality of Andhra Pradesh to be equal, or average to the rest of India. Considering that the most developed city, Hyderabad has separated from Andhra Pradesh in 2014, the result of education being average is an encouraging factor. Going into the further building and the opening of new universities in Amaravati, the score is considered as trending positively.

14. In your opinion, what was the best parts of joining a Finnish study program?

The consensus among the respondents is that the Finnish approach to education is the best part of the study program. Students expressed satisfaction with the favored self-learning concept, where independent studies are encouraged instead of teachers holding classroom lectures. The course consists of teacher guidance and daily assessment of the progress that is made in practical tasks by the students. As expected with implementation of new learning methods, the adjustment to a proactive and independent approach to studying required significant support, and ad-hoc lectures were scheduled to assist students in adapting to the conditions.

15. In your opinion, what was the worst parts of joining a Finnish study program?

Curiously, one student mentioned self-studying as the worst part of the program. As this is a single statement, it is due to the students' personal preferences to be taught in a specific way, be it due to insecurity or confusion when given the flexibility to study at his own pace. Similarly, a student mentioned the lack of academic scheduling, leading to the conclusion that the concept of project-based studies and no day-to-day teaching may not have been understood or the students' own preference for more guidance during studies. The majority of the participants replied that there was nothing bad with the program, leading to the conclusion that the majority was satisfied with the overall course.

16. What program should be next?

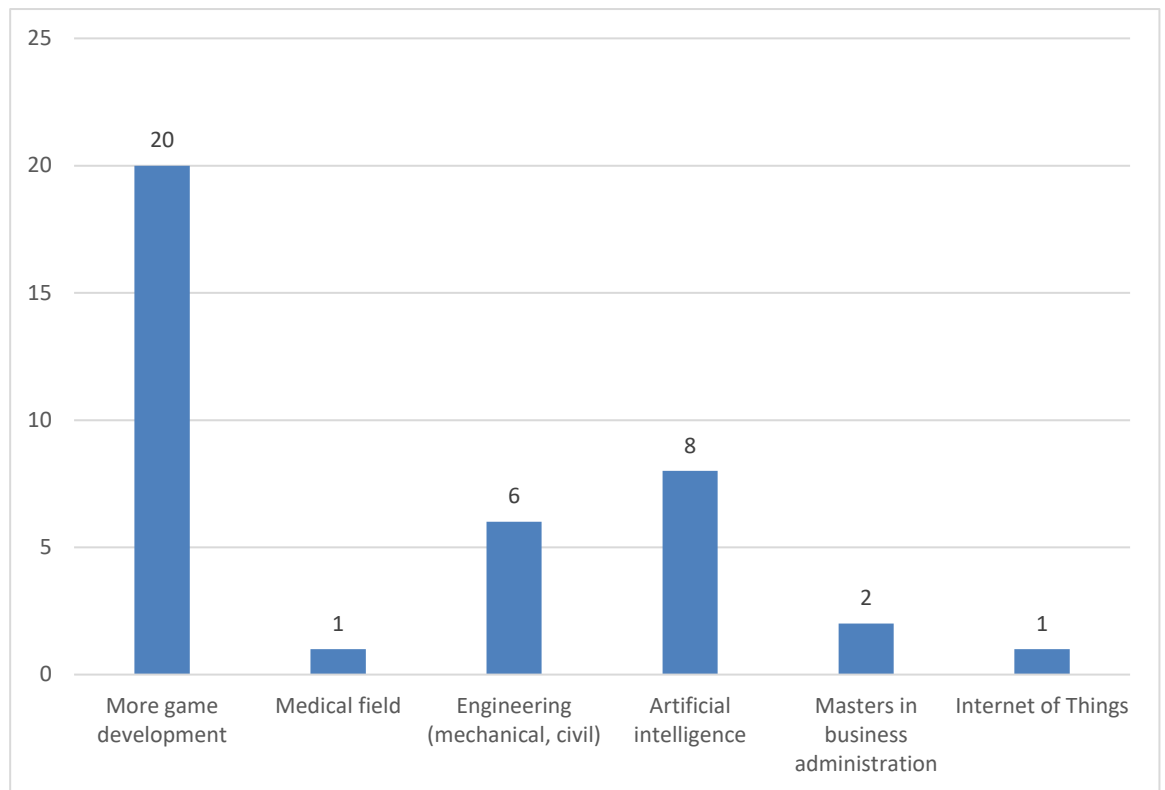


Table 15. Preference on future studies delivered by KAMK

Based on the responses to this question, the game development course has left a significant impact on the students. Although students did mention studies in artificial intelligence and internet of things, they do both fall under the broader studies of computer science. Both AI and IoT signal a trend in line with global needs in ICT. A game development graduate in programming is capable of pursuing a career in either artificial intelligence or internet of things.

17. In your opinion, what can be done to improve future programs?

Participants have indicated that an increased number of teaching faculty is desirable, providing more possibilities for interaction with students. Similarly, students noted that additional seminars, outside this course, would be desirable, as a preparatory course ahead of the summer program and additional programs throughout the year. Governmental support for developing local game development institutions and funding to invite more foreign experts is desired as well. Two respondents mentioned internships within the game development industry, which is a possibility once the participants have sufficient knowledge in game development.

18. In your opinion, what profession has the best chances for employment at the moment in Andhra Pradesh?

Respondents have identified that software development is a very important sector, particularly game development which can be supported by the government and private sector. It is stated that there is a sufficient number of employees available to fill the Information technology sector needs for incoming companies. Banking, management and entrepreneurship, agriculture have each been mentioned once. However, the respondent mentioning agriculture correctly stated that agriculture is the main employment sector, followed by software, media, and entertainment. The latter statement can be credited to the popularity of Tollywood, the Telugu speaking segment of Indian cinema. The majority of respondents noted tertiary level professions as having the best chances for employment.

19. In your opinion, what will be the most required degree in 10 years in Andhra Pradesh?

A bachelor's degree in technology is chosen as the most required in 10 years. Game development and specialization in AI are mentioned within the technology degree. Master's degree in business and technology are mentioned each once, with master's degree of any field mentioned by two persons. The observation is that the majority of respondents recognizes that some form of degree in ICT will be most required in the following 10 years in Andhra Pradesh.

20. What do you see as the biggest problems in (India's) education?

Respondents identified the teaching methods as the biggest problem in India's education. Teacher teaches the students for the exams instead of providing applicable knowledge, leading to students lacking practical knowledge skills. The quality of teaching and the quality of education was identified as the second problem area. Students learn through flawed teaching methods and are given inadequate guidance for critical thinking and development of practical solutions through independent and alternative studies. The education system lacks the practical approach and proper standardized accreditation system.

21. What do you see as the biggest positives in (India's) education?

Respondents have expressed that, although flawed, education provides personal and professional development. The government is considered as the main stakeholder in education and should provide financial support and quality improvements in education. Private universities are viewed as prioritizing profits and quantity of graduates over quality graduates. Education is seen as the solution to reduce poverty and generate an increase in economic growth.

5.2 Research review

The number of respondents to the questionnaire was lower than expected. For qualitative research, a greater number of respondents allows for better sampling of public opinion. However, the research reached saturation within the given time (30 days) and the number of responses received. Additionally, respondents were chosen from a defined audience, as they understand the context of the questionnaire and the possible implications that such a survey may have. The respondents understand that their feedback in this research can influence the future of educational programs, and it is in their best interest to contribute to the quality of the study. The responses were quite short, which is unexpected as previous experience has shown that the participants were vocal in their opinions. This may be due to the questionnaire being in written form rather than in person or through a phone call or video conference. Nevertheless, the given answer convey their opinions accurately.

The sample data gathered through this research is considered sufficient to draw conclusions. The respondents are qualified and offer valuable insight into the research area. Respondents are able to express themselves freely, as their personal information is not collected, providing anonymity and confidentiality.

6 CONCLUSION

The current perception of education in Andhra Pradesh emphasizes standardized classroom teaching, paired with standardized exams to identify and rank candidates solely based on their ability to understand the theoretical concepts of the field. However, with the newly proposed smart cities development project, the resident private universities have adopted an approach with included practical tasks, providing greater value to students. This was evident through the newly built premises containing engineering, chemistry and computer laboratories. The SRM University degrees present in the early stage are in line with the government strategy, which envisions future requirements for trained professionals in computer science, chemistry and mechanical engineering to support the sustainable development of Amaravati and Andhra Pradesh.

The concept of a flipped classroom introduced to the participants was an opportunity to experience alternative study methods. Self-study and project studies were not fully implementable in the limited time of IGDC as students lacked sufficient knowledge in programming, graphics, production or design to commit to the independent development of their games. The change to independent and project-oriented learning are steps which will foster creativity and critical thinking, resulting in students having more opportunities for diversification of their skills and employability. Such graduates can work independently and are capable of committing to own projects, which are to be subsidized through governmental startup programs. The student's preferences are shifting from the traditionally pursued engineering studies (mechanical, civil) towards the fields of industry 4.0, focusing on machine learning and data exchange.

Sectors with the highest growth potential are defined as priorities for education and skilling programs. These include the fundamental operations of starting, operating and closing businesses, project development activities and industrial infrastructure projects. Skills for the sector are developed with the support of the private sector through the assistance of APSSDC and the National Skill Qualification Framework. Several target sectors are identified, where specific policies are implemented to attract investments and employment: Car component and car manufacture, biotechnology, textiles, aerospace and defense, food processing, leather, marine and aqua and micro, small and medium enterprises.

With the current full capacity, the state is not able to provide a sufficient level of expertise to train professionals in the technology sector, inviting foreign experts to implement

their education and commit experts who can train the skilled workforce in industry 4.0 for Andhra Pradesh.

Based on the objective of the paper, research concluded that KAMK's portfolio can be expanded through courses relevant to current in-demand trends. The information and communication technology (ICT) and healthcare sectors are the two where a highly skilled workforce is required. As the Andhra Pradesh government builds the smart city of Amaravati, complimentary services in healthcare, the commerce, and business sector through small and medium enterprises (SME) and communication technologies are crucial parts of the infrastructure. KAMK's current degree's in healthcare and ICT are the two sectors to continue expanding current education programs beyond the game development.

Currently, KAMK continues negotiations with APSSDC for continuing the summer school program at a greater scale. Although the negotiated intake is 1000 students, it is still an insignificant number considering the population and that it is currently limited to a summer school program.

The recommended course of action is the preparation of program proposals for the bachelor's degree in nursing and bachelor's degree in information technology. By expanding the educational offering and broader availability of study degrees beyond summer schools, KAMK can generate local interest for students to choose the locally offered degrees or Kajaani as their university of choice, generating additional income through direct student intake.

Reflecting on the work that went into this paper, I came to understand the importance of the process. Throughout the period of research and collection of data, it was an exercise in patience to find conclusive facts in a niche field as is export of education expertise. More so as the practices in the industry are not yet established and both research and results are vague. Through continuous educational activities and monitoring, the impact of education expertise will be clearer. While direct activities are measurable and tangible, the goal of foreign help should not be long term reliability, but to rather learn and create self-sustainability through the introduced methods.

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APPENDICES

Appendix 1 Content of questionnaire

Appendix 2 Questionnaire responses

(Appendix 1)

Content of questionnaire

1. What is your gender/sex?
2. What is your age?
3. What is your place of birth?
4. What is your native (first) language?
5. Which other languages do you speak?
6. Which has been the primary language used during your studies?
7. If you could choose, which language would you choose for your study?
8. What degree are you studying? (or have completed)
9. What level of education do your parents have?
10. Have you spent a part of your studies or conducted your internship in a foreign country? If yes, please specify country and length of study.
11. In your opinion, what is the quality of life in Andhra Pradesh compared to the foreign country (or rest of)?
12. In your opinion, how is education quality in Andhra Pradesh compared to the rest of India?
13. In your opinion, how is education in Andhra Pradesh compared to the rest of India?
14. In your opinion, what was the best parts of joining a Finnish study program?
15. In your opinion, what was the worst parts of joining a Finnish study program?
16. What program should be next?
17. In your opinion, what can be done to improve future programs?
18. In your opinion, what profession has the best chances for employment at the moment in Andhra Pradesh?

19. In your opinion, what will be the most required degree in 10 years in Andhra Pradesh?
20. What do you see as the biggest problems in education?
21. What do you see as the biggest positives in education?

(Appendix 2)

Questionnaire responses

What is your gender/sex?	What is your age?	What is your place of birth?
Male	29	Vishakhapatnam (Vizag)
Male	19	Vijayawada
Male	21	Bangalore
Male	22	Puttur
Male	21	Guntur
MALE	20	Vijayawada
Female	20	Kakinada
Male	20	DARSI
Male	22	Konkuduru
Male	20	Narasapuram
Male	25	Kakinada
Male	28	Vijayawada
Male	21	West Godavari
Male	21	Madakasira
male	21	Narasapur
Male	22	Nellore
Female	20	Nellore
Female	20	Vijayawada
Male	23	Makawanpur, Nepal
Female	25	Vizianagaram
Female	19	Eluru
Female	19	Challapalli
Female	19	Kandhukur

What is your city of residence?	What is your native (first) language?	Which other languages do you speak?
Vizag	Telugu	Telugu and English
Vijayawada	Telugu	English, Hindi
Tirupathi	Telugu	Tamil and English
Puttur	Telugu	English
Guntur	Telugu	Telugu
Vijayawada	TELUGU	English Hindi, Kannada
Rajahmundry	Telugu	English and Hindi
DARSI	Telugu	English and Hindi
Kakinada	Telugu	English
Narasapuram	Telugu	English
Kakinada	Telugu	English
Vijayawada	Telugu	English Hindi Telugu
Narsapur	Telugu	English, Hindi
Tirupati	Telugu	English, Kannada
Narasapur, west Godavari	Telugu	English
Nellore	Telugu	English, Hindi, Telugu
Nellore	Telugu	English
Vijayawada	Telugu	English and Hindi
Tirupati	Tamang	Nepali, English, Hindi, Telugu
Vijayawada	Telugu	English and Hindi
Eluru	Telugu	English, Hindi
Machilipatnam	English	Telugu, Hindi
Ongole	Telugu	English, Hindi

Which has been the primary language used during your studies?
English
English
English
Hindi, English
English
English
Telugu
English
English
English
Telugu
English
English
English, Telugu
Telugu
English
Telugu
English
Nepali
Telugu
English
English
English

What degree are you studying? (or have you completed)	What level of education do your parents have?
BSc computers and animation diploma	Father - University
Bachelor of Technology	Mother - University; Father - K12
Bachelor of Technology	Mother - Grades 1 to 8; Father - University
Bachelor of Technology	Mother - Grades 1 to 8; Father - K12
Bachelor of Technology	Mother - Grades 1 to 4; Father - K12
Bachelor of Technology	Mother - K12; Father - K12
Engineering	Mother - K12; Father - K12
B.tech computer Science and engineering	Mother - No formal education; Father - No formal education
Bachelor of Technology	Mother - Grades 1 to 4; Father - Grades 1 to 4
Bachelor of Technology	Mother - Grades 1 to 8; Father - Grades 1 to 8
Diploma (Polytechnic)	Mother - K12; Father - Grades 1 to 8
Master's in computer application	Mother - No formal education; Father - No formal education
Bachelor of Technology	Mother - University; Father - University
Computer science	Mother - No formal education; Father - K12
Bachelor of technology (B.Tech)	Mother - No formal education; Father - Grades 1 to 4
Bachelor of Engineering	Mother - No formal education; Father - K12
Bachelor of Technology	Mother - University; Father - University
Bachelor of Technology	Mother - University; Father - University
Bachelor of Technology	Mother - No formal education; Father - Grades 1 to 8
Bachelor of Technology(Completed)	Mother - K12; Father - Grades 1 to 8
Bachelor of Technology	Mother - University; Father - No formal education
Bachelor of Technology	Mother - Grades 1 to 8; Father - University
B.tech computer science	Mother - University; Father - University

Have you spent a part of you studies or conducted your internship in a foreign country?	In your opinion, what is the quality of life in Andhra Pradesh compared to a foreign
Yes	2
No	1
No	5
No	9
No	10
No	8
No	5
No	6
No	4
No	8
No	10
No	7
No	6
No	5
No	6
YES	10
No	6
No	6
Yes, I am pursuing B-Tech in India Since 2015	7
No	8
No	4
No	1
America 6 weeks	5

In your opinion, how is	In your opinion, what was the best parts of joining a Finnish study program?
1	Unity
2	Friendly nature between people
5	Gaming
8	To learn
10	Yes, it is good learn Finnish education level because to teachers are told as a friendly manner and happily
9	Programming and game designer, Passion on game development
8	Gaming
3	Gaming
5	Feeling excited and we learn new things with different learning methods
7	New kind of learning environment
7	Andhra Pradesh
8	Intellectual learning
6	Self-learning is given much importance
5	Increase the self-learning capabilities
3	Application oriented learning and being ready and available all the time for students to help them.
10	I am very fascinated to learn Finnish and join in Finnish Study program. The people are much interactive.
6	Qualitative study.
8	Self-learning
8	It gives me lot of friends and knowledge about new Technology
6	It has excellent facilities and research institutions that foster innovation and stimulate intellectual and cultural growth.
3	Self-learning
1	No idea
3	Teaching methods

In your opinion, what was the worst parts of joining a Finnish study program?	What program should be next?
I don't know	More game development
Nothing	More game development
NA	More game development
Nothing	More game development; Engineering (mechanical, civil...)
Nothing	More game development; Engineering (mechanical, civil...)
Nothing	More game development
I don't know	More game development
I don't know	More game development
NA	More game development; AI
Less duration	More game development
--	More game development
Self-learning	More game development; AI; IOT
I don't know	More game development; Engineering (mechanical, civil...);AI
No proper academic schedule	Medical field; AI
Ac is too high	More game development
I didn't find any worst parts in this concern.	More game development; AI
Nothing	More game development
Less persuasiveness	Engineering (mechanical, civil...)
Nothing	More game development ;Engineering (mechanical, civil...);AI
Nothing	More game development; MBA
chances to show partiality	More game development; AI
No idea	More game development; Engineering (mechanical, civil...);AI
Nothing	MBA

In your opinion, what can be done to improve future programs?
Unity
Conduct the programs in an effective way that the students must get interest on it
Internships
We can learn
To be have concentrate on rural students
Increase the game development programs
Education system to be changed in India
Conduct seminars about gaming
Gaming Institutions establish in Andhra Pradesh
More and more programs like that
Conducting More knowledge-based events
Well-equipped labs
Awareness regarding the various courses
Increase the investments by government and invite best faculty from world wide
Limit no. of students or increase mentors. Few mentors can't handle more students. And select colleges/universities which provides good food and accommodations for the students also.
We need more number of experienced faculties.
Giving more practical knowledge
Having a fixed Schedule for the tenure of program
Innovative Educations System
Nothing
Need more iteration with the students
Internships
More camps on gaming

In your opinion, what profession has the best chances for employment at the moment in Andhra Pradesh?
animation
I've no idea
Software Engineer
Gaming
All the sectors have there is chance to get employability
No comments
Bank jobs
Gaming
Agriculture is main and software and Media & Entertainment
Management
--
Trending technologies
Almost all are having equal priorities up to my knowledge
Engineering and medicine
Software companies are more in Andhra Pradesh. Even though they don't like software jobs they are being in it. If any other companies like gaming come to AP they will get excellent
Information Technology
Anything other than engineering
Engineering
Gaming ,Software
Game Developer
Actor
Software, security,
Entrepreneurs

In your opinion, what will be to most required degree in 10 years in Andhra Pradesh?	What do you see as the biggest problems in education?
Animation	Teacher don't like to friendship with student in India
Degree	Way of teaching methods
Specialization in AI	Education quality
Gate exam	Teaching
B.TECH	No presence of self - education and future focus to students
Masters in any field	Private educational institutions
Masters maybe	Quality
Gaming	No application oriented
B.tech	Practical Learning
MBA	Student are taught what to think rather than how to think.
MTech	No Knowledge
Business management, Technical courses	Financial crisis, lack of knowledge
AI AND MACHINE LEARNING	Lack of practical knowledge
B.Tech	Proper academic framework for self-learning and skill possessed by students is zero
B.tech(any stream) is enough to do any job except for government jobs	Everyone studies just to pass the examination. Even teachers also teaching students how to pass
Masters	Quality
Graduation	Material system. Lack of self-learning. People habituated to depend on others for everything
Post-graduation in any field	Rote learning and lack of expertise in teaching
Something that helps people to grow in technology	Following the same culture
Bachelors in Video Game Design	Practical Education
PHD	lack of practical knowledge
Graduation	Importance to exams rather than gaining knowledge
Can't specify	No proper system

What do you see as the biggest positives in education?
The education has brought light from the darkness
Knowledge
Suitable mentors
Education
They can learn easily
curriculum
Concepts may be
No
NA
Self-learning in some aspects
Education is like a gate i.e. it's a minimum requirement we need to have to get a job
Individual growth, self-confidence,
Capable of understanding the problems we face
Government support
Students will get marks in examination even if they write movie stories, songs, etc... as answers to the questions. Student has to fill the answer sheet even its not related to subject.
Experience based Education
Make people more sensible career development.
Small innovative developments
Improving in qualities by government
Reduces Poverty and Increases Economic Growth
Encouraging for attending in different activities like workshops, sports...
Nothing
Learning new things daily