**FINAL REPORT**

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**Introduction**

***1.1 Background and Motivation***

The major Motive choosing behind the project is Early childhood work force has been declining these days due to various lack of reasons which is discussed and represented in the next part of the project. As Early Childhood learning is the crucial and critical foundation for learning quality of education in the Learning system, which is now suffering from the lack of employees and children who are not being taken enough care. The research interest which I was going through out this project has made me curious to perform more validate reasons for the downfall of Early childhood workforces in recent years.

The research project I was going to perform, and present would be the main reasons for the decrease of the employees and various factors which have been affecting the reduce in the employees and job count in the Early Childhood sector. This visualisation and tasks which are going to be designed in the project would be helpful for the users like government organisations, private work force schools for knowing the key reasons behind the downfall of the field and more vacancies increasing in the workforce crisis.

* 1. ***Project Objectives***

The primary objective of the project development mainly concentrates on the reasons like:

1. The shortage of the qualified staff, especially the childhood teachers and the ways for improving the staff retention in the workforces.
2. And the details of various children’s who were enrolled in different sectors in various regions of Australia across different programs.
3. Also comparing various reason like cost of fees and various service providers across which might be a major reason for decrease in the children’s not joining in the early childhood schools.

These key objectives would help the users to get an overview of the various trends and services that were provided by different early childhood services which are used in the visualizations.

***1.3 Weekly Outcomes***

Week 5-rehearsing tableau on the best way to make compelling visualizations

Week 6-learning visual designs with tableau, getting datasets.

Week 7-learning Tableau for additional upgrades and cleaning information by both manual and programmed strategies.

Week 8 – Focusing on data looking for information and creating more compelling and improved visualizations.

Week 9-Checking the advancement whether the visualizations are in track to the end result or not.

Week 10-Preparing for a Final project report

Week 11-Validation of the final project report

* 1. ***Data Source***

The data used for visualizing the project is gathered from various government resource and government websites. The collected datasets from various resources will be used for presenting the required visualisation and research purpose answers. The data is collected from

1. Early Childhood Statistics.

<https://qed.qld.gov.au/publications/reports/statistics/early-years/early-childhood>

1. Preschool Education, Australia 2018.

<https://www.abs.gov.au/statistics/people/education/preschool-education-australia/latest-release#methodology>

1. Preschool

<https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4240.02018?OpenDocument>

**Data Processing:**

Above were few of the links which will be used the visualization of the objectives which are mostly taken from the government sites. The data set contains Numerical Values which contains Integers, numeric values and character data in the datasets that were being used for the project.

The Data set which is taken from the resources doesn’t have any null variables or unnecessary data which will interrupt the data for utilising.

* But for getting exact outcomes for the project the Data pre-processing will be performed in case rather to delete the null values present in the datasets. For Data Pre-processing Python will be used as a Tool for cleaning and processing the data.
* Removing of various unwanted symbol’s, spaces in the data set and clean it by not disturbing any data present in the data sets

Although the data sets were cleaned, for making sure that no null values were present in the data sets the DATA INTREPETER was used for cleaning and sorting the data in the tableau. Through using various data sets in the project can’t ensure every data set used for creating the visualizations will be clean and accurate for the visualizations. For such scenarios pandas in python will be used and data cleaning will be performed before the data is being used for visualization process, where Null values will be either removed or being replaced with 0/1 or Nan values.

Utilizing the cleaning methods which has clarified all out, mathematical qualities can be clarified momentarily and without any problem.

As the data sets contains various work sheets the required data from the worksheets have been transformed into smaller sections of sheets and have been utilized for visualization. The unwanted data and null vales have been cleaned and taken out from the sheets for visualizations.

Data sets which were used for the visualizations has various excels sheets which were transformed into smaller excel format sheets and data has been transformed for visualizing the data. The sheets contain various information like:

* Students’ enrolment dataset with various attributes like enrolment details, states, various services providers etc.
* Staff education qualification with various attributes such as level of study, service type etc.
* Hourly fees with various hourly fee %ge across various states in.

The data sets contain various categorical, numerical, %ge values, various states details, service types, various kinds of providers which are mainly used for designing the visualizations.

**3.1 *Features Must have***

* Enrolments of various schools and children information.
* Educational Qualifications of Teachers across various states.
* Government and Non- Government Schools listings.
* Various Preschools Providers.
* Various Hourly fees in schools.

1. ***Visualization Design***

For getting better visualizations choosing the target audience and making sure that data visualized is being understood by users. And also making ensure that data was clean before visualizing which the data is visualized perfectly.

And choosing the best chart for various kinds of data will also create more impact of how better the data is being understood by the various user groups. The visualizations which were encoded were doing with bar charts, the reason for encoding them visually was the changes and growth, decrease over the relationships can be clearly visually represented and can be understood by the user easily, by encoding through the bar chart. And line chart was also visualized which is better for showing the various ups and downfalls in various values or relationships.

Chart, bubble chart

Description automatically generated

The above Dashboard shows the number of children enrolled with various services providers and there were children who were enrolled with more than one provider which is visualized in the bubble chart. The bobble chart shows the various percentage of children enrolled with more than one provider across Australia. And Tree map provides the preschool providers which are within the CBD of various states which is a major increase in enrolment percentage of preschool programs across urban places in different regions and the Gantt chart shows the %ge of students enrolled with various rages of student hourly fees across various cities. Majority students were enrolled with no fees and major cities children were enrolled for bit higher fees. The amount of children enrolled with the $0 hourly fee were more and have seen a great response in children enrolling all regions and this a factor which shows that regions having hourly fees higher have seen less enrolments in joining in Preschools. For better understanding of states with various providers pie chart has also been used as an visualization example which audience can differentiate outcome of the objective.

Graphical user interface, chart, application

Description automatically generated

The enrolment with various educational providers is only responsive in some parts of the states which has great impact for the growth of early childhood schools and some regions which are more urban may have less effective where various reason to be looked out for not enrolling with more than one provider. Bubble Chart and Tree Map were chosen to visualize the highest states which are enrolled with more than one provider and preschools which are with in CBD regions which audience can get clear idea of the visualizations. Tree map was chosen for visualizing each category percentage which can be visualized in subbranches and shown as a whole outcome.

Marks And Channels for Bubble Chart:

Marks: Points

Channel: Colour, Horizontal and Vertical Position, Area.

Marks And Channels for Tree Map:

Marks: Colour, Size.

Channel: Colour saturation, Area.

Chart, bar chart

Description automatically generated

The purpose of choosing the bar chart for these visualizations was to show the various number of service providers count in different parts of Australia, which bar chart was used for comparing between various measures for a goal. In above visualizations Bar and line Chart have been plotted for describing the various types of Provides across Major cities and remote areas of Australia. The early childhood across the remote and inner regions has less enrolments and less education qualified teachers in particularly dedicated education qualification were less when compared to staff which are ding jobs without any relevant educational background in early childhood workforce. And the Non-government education providers across various states have more programs with day-care when compared to government which lots of children were enrolled with non-government providers for better options and staff with educational qualification in the relevant field with less in numbers which government shows less numbers of staff in various schools. Many Teachers with no educational qualification relevant to field were more when compared to teachers with highest educational qualification in the field.

Marks And Channels for Bar Chart:

Marks: Lines, Area.

Channels: Horizontal and Vertical positions, length, Area.

Marks And Channels for Line Chart:

Marks: Lines.

Channels: Horizontal and Vertical positions, length.

Chart, bar chart

Description automatically generated

Among various states Queensland state data was chosen for visualizing the various changes took place over past years. The growth among various staff positions in various services have seen a huge de line and one service type has seen a rise in the various staff positions. And demand for the long day care has potentially led to the growth of staff services in particular type when compared to other services. And also number of students enrolled for the services have failed in attending the number of hours in various regions, which indicates the less students were taking the early childhood education.

1. ***Validations:***

The visualizations which are visualised were being uploaded in the tableau public server for various users to for getting reviews on designs which were processed. The feedback from the users were recorded after showing the visualizations:

Feedback from user 1: Understood the data but more precise information on various provider information can be more effectively displayed. And usage of colour gradients is more which might be confusing when looking at the information.

Feedback from User 2:

Using tableau for visualizing the detailed information is more interesting and more effective than in EXCEL sheets. And using of different types of CHARTS for various excited the suer more.

1. ***Conclusion:***

The Analysis of various childhood data sets and various education providers data, staff data has various outcome to be taken to considerations like various government providers are not recruiting qualified teachers with relevant to education qualification and no proper encouragement was shown from the government for better early childhood education forces. Non- government organisations and various education providers were majorly increased hourly fees in major cities was high was also a factor to be considered for early childhood dropouts.

And the major education providers within the cities were more than 50% which a lesser number of children from remote areas and lesser number of providers in remote areas were also one of the major lookouts for only few children enrolling in various services. Taking consideration into various factors and representing was easier with the tableau tool which can be a lot easier for audience to understand more effectively in visualizing manner. Although some of the datasets were not containing the clear information for visualizing the required outcomes, the data was transformed according to the objectives which are necessary to demonstrate in the visualizations.

1. ***Reference:***
2. Department of Education, Kindergarten Services 2020, *Data for services providing kindergarten education programs,* Queensland Government, Queensland.
3. Australian Bureau of statistics 2018, *Pre school education Australia, Canberra,* cat. No. 4240.0, ABS, viewed 23 May 2021, <https://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4240.0Main+Features12018?OpenDocument>.

**APPRENDIX:**

* **Working visualization Dashboards, screenshots, data sets have been attached below in a folder.**