

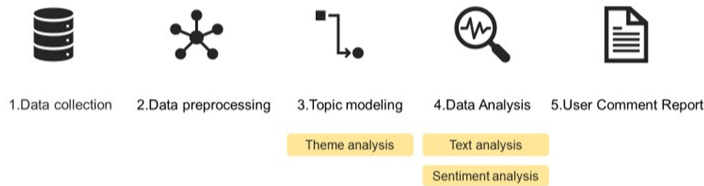
# An Exploration of the Children Programming Education for Non-native English Speaking Children in China

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## Abstract

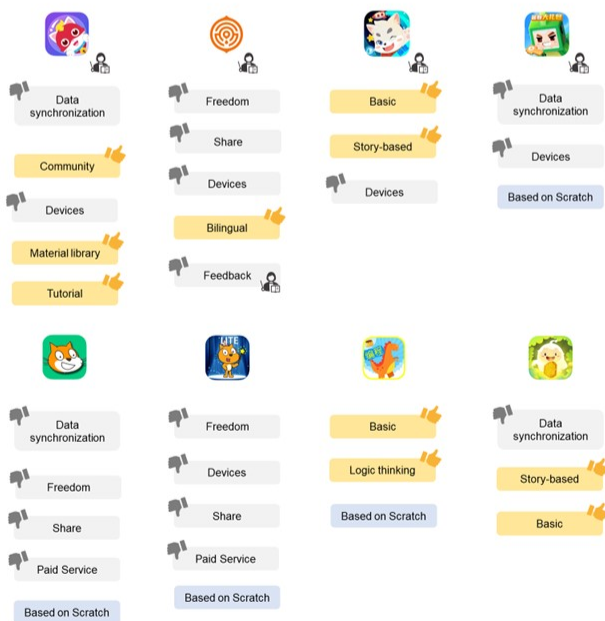
In China, the children programming education industry is rapidly growing in recent years. Some parents regard programming as an effective skill for their children's future development, for which they spend a lot of time and money. However, the current children programming industry did not get satisfactory feedback. This research aims to investigate the factors that influenced children programming learning in China and focus on children programming apps to help improve children learning experiences. The research used Information Extraction techniques to analyse user reviews finally offering design guidance about children programming apps to education providers (including developers of mobile apps).

## Research Methodology



**Information Extraction** techniques is used to get feedback from user comments. The main goal is to find information that can be used to improve current user experience for a future develop of an App. Fig above explains the approach to extract topics and analyze the user reviews.

## Data Visualization



## Introduction & Background

Compared with other science subjects, programming learning is closely intertwined with English. It can be assumed that non-native English speakers would face more barriers. Many factors may influence the effect of non-native English speakers on programming learning: computer lab, lecturer, mathematics, logical thinking and English skills. Considering all non-native English speakers as one group is unfair because actually there is variation in human languages and in their underlying cultures. Besides, adults usually have some utilitarian learning goals such as seek for a gainful job in the computing industry or get better performance in exams in universities. Most education providers are applying the adult learning path to children. The poor performance seems to be justified since children have less self-management. Children have less attention and motivation on programming learning, and they are easy to feel frustrated. Fewer studies focused on the children group when learning programming, especially in Chinese background.

Through literature review, general factors that influenced children programming learning have been clarified into the **Three Levels Model** (TLM) (Environment – Education -Motivation) and I have analyzed children programming situation in China based on TLM according to an industry survey. At the **Environment level**, China has a good basic environment for children to learn programming but there are many problems at the actual **Education level**. There is a potential market for children programming Apps and most companies are also developing their own apps rather than more interactive face-to-face offline courses. As an educational tool, mobile apps are accessible to more children while some expensive programming courses focus on some kids who live in big cities and wealthy families. Thus, the research is aimed to offer design guidance on children programming apps to education providers by analyzing user reviews.

## Research Results

### Common Problems

**Data synchronization:** Tracking progress is important, especially since the app is supposed to support education without the limit of location and time. According to the review, the loss of data largely influenced user experience.

**Devices:** It is necessary to clarify the usage device for the application. And one user mentioned abnormal usability due to 'notch' in the new iPhone.

**Paid service:** Many users are complaining about unexpected and dissatisfactory user experiences after purchase. Opening part-feature applications for free and providing a free trial period are possible solutions.

### Outstanding Features

**Community:** For elder children, a sense of acknowledgement in their peers' community is important for long-term motivation.

**Material library:** Abundant materials provide more possibilities that children can design various stories and games, which also helps children continue to explore their potential.

**Tutorial:** Teaching children how to use the tool to create their project as they want is a good way to keep the enthusiasm.

**Bilingual:** Bilingual education is conducive to children's early exposure to professional programming learning.

## Conclusions & Future Work

The children programming education Apps in China have some common problems need to pay attention to, but it is also important to identify different age group to provide specific service. For basic programming education, story-based children programming education can help enhance logical thinking and arouse interests. But for elder children, teaching children how to use the tool to create their project and share their work in the community is a better way to gain a sense of achievement for long-term motivation. And OMO (Online-Merge-Offline) education service is a new trend, for future work, it is important to explore how to make better connections between the Apps and offline real-person courses.