RESEARCH REPORT

An app as study material for
Chinese classes at Hutong School

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Document details

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Modifications

This is the 2nd version, dated of July 9, 2016. It contains the following adjustments:

- Rewritten executive summary
- Minor changes in chapter 2 Theoretical framework
- Minor adjustment of explanations in chapter 3 Methodologies
- Complete restructure of chapter 5 Discussion and chapter 6 Conclusion and recommendation. The discussion now compares the findings with existing theories, explains limitations and mentions opportunities for further research. The conclusion has been completely rewritten summarizing now the core answer of the research question. The recommendation has been restructured and contains more detailed information.
- The report now contains a table of abbreviations

In addition to these changes, the research report contains sections that already appeared in the respective research proposal. In these sections, some adjustments with respect to the latest version of the research proposal (version 3) have been made. These changes are

- The document structure and indexing has been adjusted to the guidelines of HZ University. This basically means that the chapter 2, which described the host company has been moved to the introductory chapter. The theoretical framework can now be found under chapter 2.
- The methodology overview scheme contains a step indicating the data analysis phase.
- The planning overview has been updated.
- The sample formula has been replaced with a screenshot of the actual sample size calculator.

Executive Summary

Hutong School is one of the leading Chinese language schools in Beijing and Shanghai under international management. Next to providing intensive Chinese courses along with additional amenities, the institution also places students to suitable internships. These students also attend Chinese classes with Hutong School during their stay. To standardize the course concepts and learning processes, Hutong School recently published its first corporate study book and it is anticipated that further books and publications will follow. To make learning more convenient and modern, Hutong School desires to have a mobile app to be used as study material.

This report deals with the research that has been made about the topic of language study apps and provides first insight into the requirements for a future Hutong School study app.

In a first stage, the researcher defined the exact research topic and scope. He focused on teaching concepts about studying Chinese, but also on methodological principles existing language apps are built on. In an initial stage of literature review, important aspects about the Chinese language structure, the methodologies of teaching Chinese, but also other languages, the purpose and development of language studies apps and its appliance by students (users), followed by a spotlight on further digital tools like communication, testing and assessment tools have been analysed.

In a second stage, several practical research instruments have been applied. First, an online survey with current Hutong School students has been conducted to find out their opinion about such a tool and their wishes and demands since this is the group that will use the app. In addition to that, the researcher conducted an interview with the education manager of Hutong School to find out more about the methodologies applied by Hutong School and its current course concepts. Building up on this interview, further interviews with Hutong School teachers have been conducted to investigate if teachers would make use of such an app and for what kind of functions such an app could be useful.

In a third stage, the researcher contacted several app publishers and also tested existing Chinese language learning apps and reported observations he made from these apps to obtain an overview of typical structures and functions of such language learning tools.

The results have been summarized and compared to the theories and concepts that have been already elaborated in the literature studies to discuss to what extend the findings can be applied to Hutong School.

Finally, Hutong School receives a recommendation containing a requirements list for its future app. This requirements lists is divided by front end and back end development processes. While this research project answers the questions of the requirements of the planned Hutong School representing all stakeholders, the students, the teachers, the education department of Hutong School and app developers, it leaves room for more research, especially about further insight into app development and budgeting. The requirements list can be used as the basis for such continuative studies.

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Abbreviations

ICP	Intensive Chinese Program	A program at Hutong School, designed to learn Chinese. Usually, students follow 20 hours of group classes per week.
IP	Internship Program	A program at Hutong School, designed for students searching an internship. Next to the internship placement, students also have the opportunity to attend 4 hours of Chinese classes per week.
MB	Megabyte	A unit for digital information storage.
CPU	Central processing unit	It is the electronic circuitry within a computer that carries out the instructions from software or the operation system.
US$	United States Dollar	The currency of the United States of America.
HK$	Honk Kong Dollar	The currency at Hong Kong.
CNY	Chinese Renminbi Yuan	The currency of the people's republic of China.
SSL	Secure Sockets Layer	Is the standard security technology used for communication between a web server and web browser.
TOEFL	Test of English as a foreign language	A standardized English proficiency test that is often required for admission to university programs.
HSK	Hanyu Shuiping Kaoshi	The Chinese official language proficiency test.
SRS	Software requirements specification	It is a description of a software system that will or has to be developed.

1   Introduction

1.1   Terms of reference

This research report deals with the topic of identifying needs and requirements for a digital learning application which integrates into the existing portfolio of study materials of Hutong School. It is part of the course CU06793 and is the graduation assignment of Dominik Krause. It will be reviewed and assessed primarily by Frank Peeters from HZ University and the first version has to be handed in before June 21, 2016.

1.2   Introduction to host company

Hutong School was founded in 2005 by a team of French, German, Korean, Flemish and Chinese entrepreneurs. It was the first officially licensed Chinese language school operated by a European management. Today, its product portfolio consists primarily of three programs, the intensive language course, an internship placement and a volunteer program. In addition, customized programs which suit individual requirements can also be arranged. These services are often booked by international companies in Shanghai.

With locations in Beijing, Chengdu and Shanghai, Hutong School has three offices in China, however, intensive language courses are only available in Beijing and Shanghai. Furthermore, it has also several locations outside China as in Brussels and London and in cooperation with other institutions also in Milan, Moscow, Paris and Sydney. These locations outside China ideally provide students with introductory courses before they immerse with the Chinese culture.

Today, Hutong School in China has welcomed more than 2,000 students from across the world. On average, around 450 students annually are attending programs of Hutong School in China. In the year 2015, Hutong School had around 490 students creating more than 10.5 million HK$ revenue (approximately 1.35 million US$) of which 53% can be allocated to its location in Shanghai. (Hutong School, 2016). Prices for the Intensive Chinese program range from 998 US$ to 2,756 US$ per month depending on the accommodation options and the program duration.

1.3   Problem statement

Hutong School welcomed already more than 2,000 students from across the world. With an increasing amount of students, Hutong School is also hiring more language teachers. To standardize the course content and concepts it is desired to have corporate study material. In 2015, Hutong School published its own study book for Chinese beginner classes. It is planned that further study books should follow. However, to compete with time, Hutong School prefers to have a corporate app which will integrate in the future collection of study material. The purpose of the app is to be used as study material in language classes including selected features that can also be used outside classes like for homework or assignments.

However, the concept for a Hutong School app and its further development to provide online courses is at the very beginning stage. It has to be researched on the specific functions an app for study material needs to have including pedagogical teaching aspects and how intensively the students would prefer to use an app for the different course contents instead of the old-fashioned way.

The research phases consisted of literature review on app development, Chinese teaching methodologies, concepts of language apps and the key to make an app successful as well as comparing different tools and functions of already existing apps. This stage followed qualitative and

quantitative research on requirements that make it easy and successful for students to study Chinese based on the opinion of Hutong School's current students, the teachers and education manager of Hutong School and selected language app companies.

1.4   Purpose

The purpose of this report is to inform about the research processes and results identifying the needs of students who learn Chinese and there requirements for an app they could use as study material in addition to methodological principles and technological tools that are required to make a language app successful and useful as study material . The aim of the research is to find out the requirements for an app in order to be applicable as standard study material for the various Chinese classes at Hutong School and accepted by both, the students and the teachers.

Hutong School received a recommendation in form of a factsheet listing the requirements for the future app design. The requirements are based on the data collection of literature review and the practical research described in the following chapters of this proposal.

1.5   Research question

How should Hutong School's study app be designed to be used as study material for its language courses?

What are the requirements for a Hutong School study app in order to be suitable as study material for the institution's language courses?

In order to answer the main research question, sub questions will lead to the result.
- What do students require when learning Chinese?
- What is the purpose of an app to study languages?
- What are the app features most valued by students?
- What methodologies/learning approaches are people applying when studying Chinese?
- How intensively would students use such an app in addition to class hours?
- How customizable would an app be if it is developed independently in contrast to a "white label" purchase?
- For who will this app be available?
- How many students would follow online courses as a preparation for their stay in China?

1.6   Scope

This report analyses several opportunities how to develop a Hutong School language app, based on the students' preferences, the methodological principles applied by Hutong School, the opinion of teachers and input of several app developers . It delivers a recommendation about how the app should be designed and how it could be created. The required functions and features have been derived from literature studies as well as through practical research collecting the opinion of Hutong School's students and the methodological principles of Hutong School and several app developers.

In order to successfully introduce the app, further research on development prices and conditioning factors like digital support needs to be executed. In summary, the results of this research will consist of a recommendation in form of a requirements factsheet, in which all requirements for a future app are listed and a recommendation for the development type is given.

1.7   Procedure and planning

The progress of the research processes including the planning and preparation phases are illustrated in the overview below.

Events	March 07	14	21	28	April 04	11	18	25	May 02	09	16	23	30	June 06	13	20	27	July 04	11	18	25
Start Document	■	■																			
Start Internship (started March 1st)																					
Working on Research Proposal	■	■	■	■																	
Hand in Research Proposal				■																	
Hand in improved RP						■	■														
Work on research execution							■	■	■	■	■	■	■								
Hand in draft report															■						
Hand in final report																■	■				
Hand in discussion portfolio																		■	■		
Thesis Defense Presentation																		■	■		

■ Preparation Phase	**Deadlines given by supervisor:**
■ Orientation Phase	July 4, 09.00 Handing in Research Report Draft version
■ Execution Phase	July 14, 09.00 Handing in Research Report Final version
■ Completion Phase	Due to an earlier Thesis Defence presentation, these deadlines are subject to change and will be confirmed by the supervisor.

Image 1: Planning overview

The very first stage of the research process was literature review analysing different aspects about the app- and digital learning technologies. In a second stage, the opinion of Hutong School students at Beijing and Shanghai facilities have been collected through an online survey. Simultaneously, interviews had been executed with the education manager of Hutong School and several teachers, and also selected app publishers or developers have been contacted.

2 Theoretical framework

2.1 Chinese teaching methods

2.1.1 Introduction to characters

For western native speakers (alphabetic languages), starting with Chinese is often very hard as for a beginner, it seems that there is actually no relation between a pronunciation and the character writing. In addition, it is nearly impossible to derive the context of a written word (syllable). Chinese government requires the knowledge of at least 800 characters to be considered literate (Hodge & Louie, 1998). Around 3,500 characters are considered to be necessary to be able to read and write about 99 % of the Chinese language.

Although it does not sound attractive to study 3,500 characters, a research team at Beijing Normal University, guided by physicist Jinshan Wu has discovered that the Chinese written language is built on a simple basis. A few standard strokes build radicals, which form the basic characters out of which more complex characters are built. This network is hierarchical which means that being able to identify the radicals out of a character allows the reader to estimate the rough context of it. Therefore, the team suggested to study the important 226 radicals first and then spread out gradually towards all the radical extensions (Brall, 2013).

2.1.2 Introduction to pinyin

Whereas Wu's method could cause students to start learning words and expressions they are very unlikely to need during their stay in China, Hutong School currently follows the principle of separating spoken Chinese and character recognition. This way, students learn basic conversations in pinyin (official Latin alphabet transcript) first and start with character recognition once they are able to perform some small talk and understood the pronunciation system (tones). According to the institution, the student experiences faster results as he is able to immediately apply recently learned skills (Hutong School, 2016). Peking University for example, also offers beginner courses (online) completely without characters (Liu, 2016).

Some Western linguistic scientists however believe that forcing students first to remember the pinyin writing, which comes with much more accents per word than languages like Spanish or French, and switch then to characters only can overstrain students as the volume of vocabulary to be studied, basically doubles. However, some students prefer the separation method as the shift towards a new language system is more coherent. Chinese children in elementary schools spend much time on writing starting simultaneously with the characters and pinyin (Hauser, Gebrauchsanweisung Chinesisch, 2015).

2.1.3 Pinyin for electronic writing

Pinyin has become important to Chinese people as well as it is nowadays the most convenient way of writing on digital devices as the software does the transcript into characters. Good software is also tolerant of accent mistakes and transcribes into the correct character based on the context of the sentence. Therefore, a lot of digital dictionaries allow to enter a word in pinyin and will then deliver the character as well as the translation in the selected language and vice versa.

To summarize, a golden general rule on how to learn Chinese best does not exist so far and the learning approach depends strongly on the skills and talents of the student. Therefore, an app which offers both, the characters and pinyin transcript should be of advantage as it lets the student decide.

2.1.4 Vocabulary is key

The grammar in Chinese is comparatively uncomplicated, especially when compared to Western languages. Verb conjugation does not exist, there is also no noun declension and the sentence structure is very simple (Boston University, n.d.). The only obstacle to tackle is obtaining a rich thesaurus. Whereas students who learn languages like Spanish, Italian or even German might already start after a few hours to learn building sentences, the Chinese learner is exposed to endless-seeming vocabulary sessions.

Hauser suggests to combine multiple ways of obtaining vocabularies. She recommends that students should start reading simple texts, but also to listen to radio or watch Chinese television in addition of listening and reading during the everyday life in China. She adds that the key of this tactic is "efficient looking up in dictionaries" (Hauser, Gebrauchsanweisung Chinesisch, 2015). The convenient possibility of looking up words quickly and everywhere is one of the key advantages of an app. Some software allow next to pinyin also the traditional way of identifying characters through the radicals system and, advanced software comes with a handwriting recognition where the user simply paints the character with his finger (Pleco Software, 2016).

2.1.5 Talk with the phone
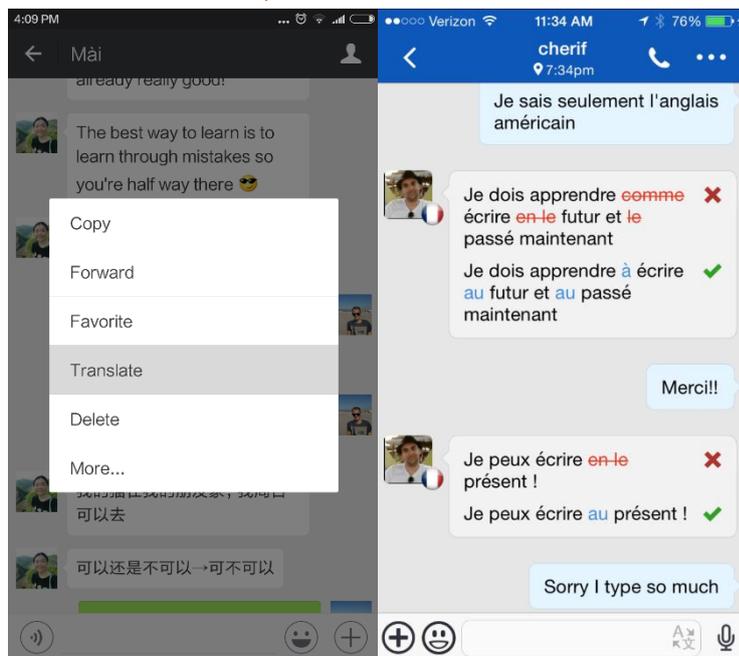
Image 2: Translation tool in WeChat® (left) and instant correction in HelloTalk® (right).

Everyone who has ever been to China should have experienced that the most popular communication app used is *WeChat®*. *WeChat®* allows next to text messaging also a bundle of features like internet voice and video calls and walkie-talkie simulation (WeChat, n.d.). As at least the text messaging functions has an integrated translator, it can become a great tool to communicate with Chinese people. As it is owned by *Tencent*, one of the biggest Chinese technology companies (Elliot, 2014), it is mostly used by Chinese people and therefore a good way to get in touch with a Chinese native speaker. However, the contact details needed to be exchanged first.

Another app offering similar communication functions but with a learning purpose is *HelloTalk®*. This app connects a language learner with a native speaker who is currently learning the native language of the other person. The conversation can be assisted with an integrated instant dictionary. Both apps are free and can therefore be a very convenient way to practice speaking Chinese (Zhou, 2016).

Image 3: QQ music shows lyrics synchronized to the song

A study at University of Edinburgh revealed that singing songs in a foreign language supports a faster and better speaking learning progress. In the research project, adults had been exposed to Hungarian songs, as according to the research team, the Hungarian language is very unfamiliar to most native English speakers (Ludke, 2016). Luckily the app of *QQ music*, China's most popular on-demand music service, displays the song lyrics in karaoke style (synchronized to the song).

Research at the University of Illinois in Chicago proofed that people learn languages faster in a native speaking environment. During an experiment by Kara Morgan-Short, adults had been immersed in a native speaking environment of an artificial language and showed a much higher similar brain activity to native speakers than the control group that learned the same artificial language by explanation of rules. Even after the immersion period, the immersed group still made good test scores and the brain processes became more similar to those of native speakers (Morgan-Short, 2015).

Whereas the Hutong School students already have the best environment for learning Chinese – the Chinese cities – there may be opportunities of analysing the learning progress of a student with the app and then giving suggestions for the perfect learning environment based on neuroscientific research.

2.2 The purpose of language studies apps

2.2.1 Convenient and space saving

Language apps basically support a more convenient learning. Whereas studying with textbooks and dictionaries must be done at home or somewhere with enough space, an app requires only a few MB on the cell phone. This allows the student to learn the language whenever and wherever it is convenient to him (Haburchak, 2014). This can be, for example, during the daily 20 minutes subway ride or while sitting in the waiting room of a doctor. Students reported that learning with the help of apps was generally more fun and playful than repeating random vocabularies on flashcards. Apps allow to learn vocabularies by playing games (Oxford University Press ELT, 2011) and tend to give rewards sooner and more often than a teacher in a classroom could do. Moreover, many apps, like the very popular *Duolingo*, feature progress algorithms to perfectly suit the user's individual learning speed (Duolingo, n.d.). The company advertises that learning a language with the app only is faster than following a language course at university as it makes communication easier.

2.2.2 Repetition and communication are crucial

Every classroom student may have experienced that a nearly perfect knowledge about the grammar does not allow automatically to join a conversation. But this is what people usually want when learning a foreign language. So it would be better to be able to speak with incorrect grammar instead of worrying about having a correct sentence structure and therefore, hesitating to talk. Building up on that, it is of crucial importance to constantly repeat and apply the recently acquainted knowledge (Groves, Hopkins, & Reid, 2015). This is one of the unbeatable advantages of apps when users get out there phones whenever they have a few minutes spare time and repeat or practice even very small lesson.

2.2.3 No shame of mistakes

As students usually use apps when being alone, it is much more unlikely to feel ashamed or offended of mistakes. In other words, the inhibition rate of risking to do a mistake will be much lower than in a classroom with 20 other students who could judge the performance. This missing pressure can support but may also delay the progress speed since the in-class competition is missing. Expressing it more strongly, apps can be a very nice tool to learn a language but if the learner is aiming to go beyond the little restaurant conversations, intensive courses (including to study abroad) may not be substituted (Saussure, 2015).

2.2.4 What makes an app good/effective?

It is unlikely to find "the one and only" app featuring all the functions a student requires (Rosell-Aguilar, 2014). Luckily, a tablet or a smartphone nowadays offer enough storage for several language apps which, together, can provide solutions to all the needs of a language beginner. Students report that usually, apps are a good start but after a while, they want to apply their acquainted skills which means they want to talk. To summarize, next to vocabulary, listening and writing lessons, an app needs to give the opportunity to communicate like having a skype call with a foreign native speaker (Rosell-Aguilar, 2014). A very successful app should be focused on a very few user aspects, according to Ashish Toshniwal, CEO of Y Media Apps. Apps that come with too many features overwhelm the user and require usually a lot of disk storage and CPU which makes the app very slow on older or cheaper devices. If the purpose and main benefits of the app cannot be explained or demonstrated within 10 seconds, the app is likely to fail (Toshniwal, 2014). In order to retain users, the app needs to reward using it. This way, the human brain is stimulated in a positive way and is therefore motivated to perform the same action again. More rewards trigger to use the app more often which leads to a habit (McDonald, 2014). To strengthen the habit, McDonald suggests to build in an element of investment. People are less likely to give up things where they had invested in already.

2.3 App development

2.3.1 The white label

White label app builders allow companies to keep the mobile software development in-house. It is possible to customize the app so it fits in the corporate branding and there is no need to hire a team of programmers to create functions of the app (McLandress, n.d.). However, the basis of the app will appear familiar to the customers as it is built on standardized items like menu bars and settings whereas organizations will be totally free when it comes to features and design when developing their own app independently (Custom mobile app VS white label mobile app * mtrip, 2013). However, advanced app features require a very high app programming knowledge and skills that constantly need to be updated. For a small company, this is barely to achieve but large white label app builder advertise with having their features always up to date. Moreover, some builders call themselves a cross-platform company which means apps can easily converted to other platforms like television screens in airplanes or on-demand video platforms (MarketJS - Integrated Hardware Game Solutions, n.d.).

2.3.2 The user experience

A very important aspects, most white label builders cover, is a smooth and friendly user experience since the software companies usually have experience and constantly track their app performances. Independent software developments may lead to a failure when it comes to the first impression after the app has been published. Even if all bugs become fixed within a very short time, it might be hard to

balance the bad reviews and the app is unlikely to be successful (Custom mobile app VS white label mobile app * mtrip, 2013).

2.3.3   Security issues

The internet became a huge platform for criminals since it is safer to make profit out of misusing data instead of robbing persons on the street. One of the most common mistakes app developers do is an insufficient SSL technology, followed by several external inputs from sources that have not been sufficiently verified about their credibility and trust (Panda, n.d.). This often results in data leakages. The most important question when developing an app is who takes the security responsibility. White-labels guarantee several safety standards, they usually have a support and development team which is constantly searching for leaks in order to fix these bugs. However, also third-party purchases (like white-labels) should be checked for their credibility as they gain access to several services and data collections (Fairchild, 2014). According to Mano Paul, it is crucial that everybody who is involved in the development process is aware of the technology (Paul).

Although some people still believe Apple iOS devices cannot be infected by malware, also Apple struggles with several viruses, although not that frequently as Android is doing (Lee, 2014). Trojans and other malwares are often programmed in a way to scan for personal data once being placed on a device, but also use several ways of "reproduction". That can be through sms or chat messages, emails, but also through insufficiently secured apps.

2.3.4   Stay up to date

Nowadays, it seems that there is nothing of higher importance than staying up to date. Cell phone operating systems (OS) do frequently upgrade and so is expected from app publishers too. In addition, customers who purchased an app expect updates and enhancements of functions and features (App Entwicklung | mobivention | Whitelabel Apps als kostengünstige Alternative, 2015).

2.3.5   Android or iOS?

The primary reason why companies sometimes focus on only one OS is that developing an app for both increases the costs immensely (Eadicicco, 2014). Toshniwal stated for Business Insider that innovative ideas should be first executed on iOS as people are more open to explore "cool stuff on iPhone" and once the app became very popular, it should be launched on Android as well. In addition, iOS users tend to spend more money for apps and in-app purchases (Toshniwal, 2014).

2.4   Revenue streams

In general, there are only two different revenue streams that result from a successful app. This can be the revenue resulting from the app sales price which is paid for downloading the app or revenues of in-app purchases as many apps provide free light versions to attract uncertain users. However, a lot of apps are available for free but have reached a very high value since they offer an extensive network of consumers and users to which the access can be sold. One of the most common examples for this strategy is, according to Ashish Toshniwal, CEO of Y Media Apps, apps like Instagram and Vibe (Toshniwal, 2014). He sees revenue potential for direct app sales currently only in gaming apps. For all other kinds of services, he describes the market as really competitive. In his opinion, the only chances so far are in free light versions with payable upgrades to unlock further functions.

2.5   Digital courses

Companies like Coursera.org or Ng.org are about to change the learning and teaching standards. Many see the educational future in such a concept as it grants access to education much easier, broader and

cheaper compared to classroom lectures (Rolletter, 2014). In addition, those education platforms allow the formation of very extensive student groups on chats and forums. As participating students are obliged to follow the classes at the same time, the students can interact and talk about the lectures and topics, as well as help each other (Kamenetz, 2012). Students report that they receive instant help within seconds and can benefit from the international backgrounds of the students in a dimension that would never be possible on a university campus.

Another aspect is the fact that most of the courses are free, only for receiving a certificate or doing a final exam, a fee is charged (Anders, 2014). This way, students are more likely to explore several courses and can switch from topic to topic in order to find their perfectly suiting field of interest. However, it has been warned that these approaches are more useful as an add-on and should not replace actual real classes. A modern way of teaching would be that students watch the video lecture at home and the class hours can be used to discuss about theory or work on projects (Oremus, 2013). After watching the online content, students should fill out a survey to indicate which parts they understood and which aspects need to be covered by the teacher again. This way, the teacher can adjust the lessons much more to the actual needs of the students.

Currently, a cooperation with Linguese® has already been made which offers students online preparation courses. The course content has been checked to match Hutong School's study plans, however having these services in-house might be a further step to become market leader (Bhasin, n.d.).

2.6   Test/assessments

After studying a while, people usually desire to experience recognition and also want to proof their achievements. Usually, language proficiencies are proven with standardized and often expensive tests like TOEFL (Gao, 2015). This is one of the most intensive reasons why a lot of language takers would like to be able to prove their language proficiencies digitally and receive a recognized certificate. In addition, many students live far away from language test centres which increases test taking efforts and costs immensely (Velayanikal, 2016). However, so far the only commonly known certified online language test is possible with *Duolingo* (Velayanikal, 2016) requiring a high level of security efforts. According to the company, the test is equipped with a couple of security procedures like verification of ID and remote proctoring which means a human supervisor is watching the test taker through webcam. This is a comparatively high effort and it is not sure that such measures would be possible for a $20 exam fee to a broader audience (Calimlim, 2014). Duolingo's exam fee is currently $20, but it is expected that the company will raise its price once the test is recognized by more institutions and organizations.

2.7   Digital in-class communication

It has become quite popular to use digital tools for an in-class communication. The most common known is *socrative*®. Tools like this app offer teachers to collect immediate and individual feedback. It is also possible to do an instant quiz to check whether all students understood the topic and are at the same level (Formative Assessment Strategies & Tools | MasteryConnect, n.d.).

Although these kind of tools are usually very beneficial for larger group sizes, it may also be handy for small teaching groups like at Hutong School. According to Bradley Lands, these tools simplify lectures a lot as it speeds up processes and students are usually amazed by the modern teaching approach (Lands, 2012). All required is a mobile device (laptop, tablet, smartphone) and a reliable internet connection.

Furthermore, using such digital tools has the benefit of easily reporting the students' progress and performance. This can be helpful to evaluate the effectivity of courses and adjust course concepts where necessary, but may also be interesting for marketing purposes as it can be seen as a proof that students gain a certain proficiency level after a certain period of time (Bharti, 2014).

2.8   Comparison of language apps

2.8.1   E-learning tools supported by Hutong School

The following apps are a selection of apps for which Hutong School students receive discounts and can apply in addition to their language classes.

Skritter

This app is a very common language learning app featuring vocabulary learning using pinyin, traditional characters and simplified characters. It also features handwriting recognition which is tolerant to stroke orders. The app enjoys mixed reviews on the internet as some users classify this app as being overpriced or complain about a lack of updates while others like it give high ratings. However it can be seen as a good app for beginners.

Pleco

This app is considered to be one of the best Chinese dictionaries. It also has a very high user amount which is usually an indicator of quality, especially for paid apps. Many people (especially beginners) love the tolerance of stroke errors when painting Chinese characters.

Nemo Chinese

Nemo Chinese is a very modern app which is especially popular on iOS devices. People like that it allows to study both traditional and simplified characters. The app comes in a lot of languages which allows a more convenient learning experience to non-English speakers.

Chinese Skills

This app is focusing more on the Asian market as it appears in Japanese and Korean next to English. It is seen to be one of the best free apps available in app stores. It appears to be very new and becomes updated frequently.

2.8.2   Advanced language apps as a benchmark

The following three apps are a selection of more advanced Chinese learning apps. These apps can be used as ideas to create the future Hutong School language app.

FluentU

This is a very modern app which is currently only available for iOS 8 devices. The methodology is based on in-app videos with subtitles. The app offers all of the platform's videos with interactive subtitles (it is possible to click on a character in the subtitle to see its definition), flashcards based on the videos and audio tracks of the vocabulary.

The Chairman's Bao (TCB)

TCB is an online newspaper that has been simplified for people learning Mandarin. The newspaper publishes news on very diverse subjects which are written in Mandarin by native Chinese professors using the HSK vocabulary list. It also features an integrated interactive dictionary and allows to choose between simplified characters or traditional characters. The app is suited for students with HSK 3 or higher levels. The articles are written based on the HSK levels and are classified so e.g. and HSK 3 student can pick HSK 3 articles and be sure to meet only familiar characters.

Memrise

The strong point of Memrise is its mnemonic rules and its community, which is all integrated into an SRS software, designed to help remembering words by using visual or conceptual mnemonic rules that are created and tested both by the developers and the enormous community of students that it has. So, basically, when using Memrise, you are taking advantage of the experience of students that have gone through the same process. It comes in a free and a pro version.

The information in this app comparison is taken from the data provided by Apple iTunes, Google PlayStore and a blog article from (Zhou, 2016).

2.9   Summary and appliance to Hutong School

Apps can be a convenient method to start studying a language. As no heavy books are needed to be carried around, it is more likely that students will make use of the app whenever they have a few minutes of spare time like waiting for the bus or during lunch break at the office. However, exactly this may also be a disadvantage as people may not be fully concentrated compared to when intensively studying in a classroom or at home. Hutong School can combine the advantages of an app with the benefits of studying intensively in small classes to optimize the students' learning performances.

Whereas opinions on the best teaching methods for Chinese differ, it can be said that all methods require the student to build up a large thesaurus. An app with a vocabulary trainer can be very helpful for students. As the teaching theories differ, the app needs to let the student decide whether he would like to start with important small talk conversation first or follow the principle of Jinshan Wu, where characters (and simultaneously the vocabulary) are studied based on the radical hierarchy. The Chinese learner should make use of several ways to obtain a larger vocabulary knowledge including the use of media. According to the University of Edinburgh, singing songs in the foreign language contributes to faster and more correct oral progress. Crucial for all methods is, according to Hauser, an efficient looking up, meaning that students should search words they come across in a dictionary. As some students may only stay for a shorter period of time and do not set up a Chinese mobile phone contract, the app should work also offline to enable students using it independent of internet accessibility.

According to Toshniwal, a good app should focus on a few benefits only. The practical research is going to show which aspects students prefer most to have in digital form and with which they would rather continue the conventional way. A huge advantage of an app compared to study books is the opportunity to update the content more efficiently than with printed material. This means that Hutong School will be able to adjust the app contents based on new teaching methodology findings.

According to app experts, a successful app must reward its users to keep them motivated in using it. Functions like vocabulary training, quizzes and assessments and gamified lessons usually reward users (at least with a score which is added to a high score list) and are already existing and available for purchase from "white-label" app developers. Purchasing a white label may has many advantages as the software is usually already tested and applied several times which makes it relatively stable and also secure since security bugs are usually constantly fixed by a support team. Developing an app independently means that the developer needs to cover all these aspects himself and has to take the responsibility for the app and consequences it may cause on the devices of its users. However, these aspects face the unbeatable benefit of being able to introduce a unique app which did not exist before and can be a way to differentiate from competitors.

As the app would be designed primary for in-class usage, it might be very handy if the app also features a communication tool so that students may interact and teachers can collect feedback or do quick assessments during classes. A beneficial "nice-to-have" feature might be to equip the app with several quiz and assessment features so that students can constantly check their proficiency level. As Hutong School in Shanghai is an official HSK centre (official Chinese proficiency test), the quizzes should be adapted to the requirements of HSK. The results of the practical research will demonstrate whether the students are interested in such features.

As Hutong School is currently running a cooperation with Linguese® which provides students with online courses to prepare for their China immersion, it might be interested to set up the app plans in a way that the app later can be expanded that the institution can offer these preparatory online courses in-house. This can be an important step towards Hutong School's long-term goal, becoming market leader for China immersions (language studies and internships).

3 Methodology

3.1 Research purpose

After executing literature research to obtain the basic requirements and functions for a language learning app, the practical research demonstrated the actual opinion of the Hutong School students. It also considered the methodological aspects of language teaching at Hutong School which need to be covered by the app and investigated on what methodological principles other app developers have built there software.

The purpose of the research is exploratory as previous studies did not exist for the Hutong School population or a comparable population and so far, its direct competitors do not feature such app tools neither, which eliminates any potential references. Therefore, the basic level of information had to be collected (Kowalczyk, n.d.). Although language apps do already exist and many people apply them to study languages, it cannot be completely generalized to be suitable as classroom study material. The idea of using an app during classes instead of study books needs to be explored in several dimensions. Exploratory research is usually applied to obtain deeper insight into a problem (Saunders, Lewis, & Thornhill, Research methods for business students, 2009).

3.2 Strategy

Hutong School welcomes students from all over the world with different educational backgrounds, different ages and also different levels of Chinese proficiency, resulting in an extensively mixed research population. As digital learning methods are new to Hutong School and a future app needs to meet several demands from students, but must also comply with pedagogic teaching requirements, a mix of quantitative and qualitative research has been chosen as an appropriate strategy. Whereas quantitative research provides a measure of peoples' opinions based on a statistical and analytical point of view and is generally demonstrating relations (British Library, n.d.), qualitative research is usually applied by scientists to deliver answers to specific problem questions (University of Southern California, 2016).
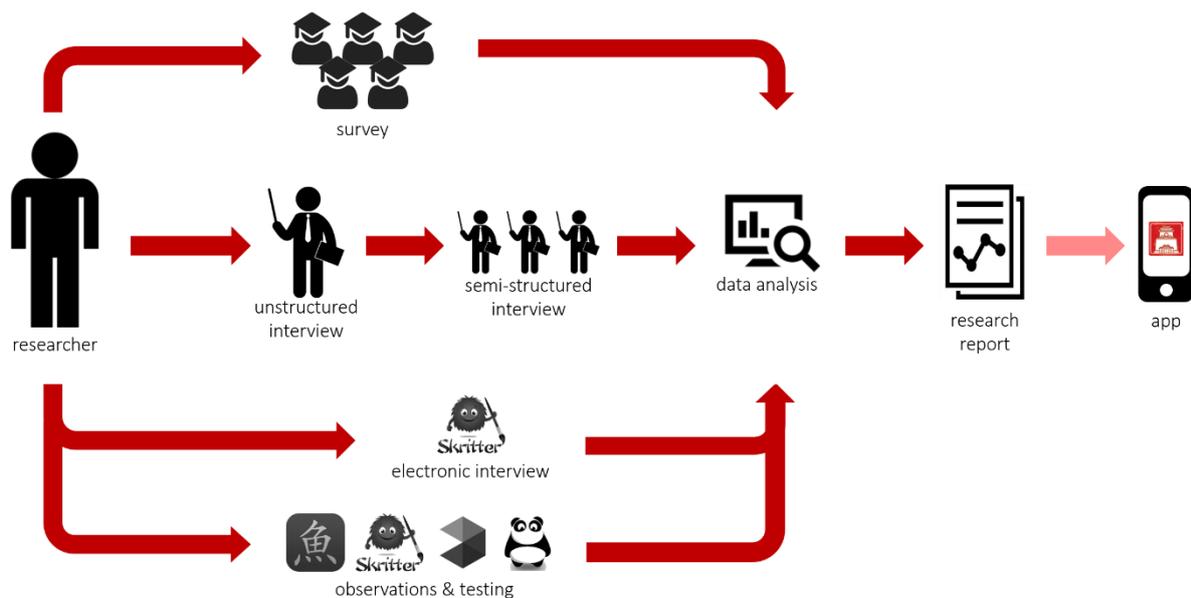

Image 4: Methodology expressview

➡ Task executed by researcher   ➡ Future development (not included in this project)

3.2.1 Survey

A survey addressing to the current students at Hutong School's locations in Beijing and Shanghai has been seen as one of the ideal instruments. Surveys allow a lot of automatization when it comes to data processing. A survey usually needs to be created and formatted only once and is available for the entire period needed. In addition, it allows to withdraw generalizations since the research conditions had been more or less the same for all participants. A survey is mostly very cheap as sampling is applied which allows to extract results that are representative to a whole population although only a smaller sample has to be investigated. It is very flexible in terms of workload as only the creation and the analysis requires manual work whereas the data collection phase is running automatically. Furthermore, a survey allows a quantitative results analysis based on descriptive statistics which usually delivers correlations and shows frequencies.

3.2.2 Time planning

According to *surveymonkey®*, an online survey software provider, a survey should be open to answer for at least 7 days, as within the first seven days 80 percent of the responses are collected (Zheng, 2011). Unfortunately, the initial response rate was not very high, therefore, the running period needed to be extended to meet the students and encourage them to participate in the survey.

Events	April		May					June				July			
	18	25	02	09	16	23	30	06	13	20	27	04	11	18	25
Scheduling interviews at Hutong School	■	■													
Initiating electronic interviews	■	■													
Airing survey		■													
Executing interviews			■	■	■										
Analyzing and processing results					■	■	■	■							
Hand in Research Report Draft Version									■						
Deadline for Finalized Research Report										■	■	■	■		
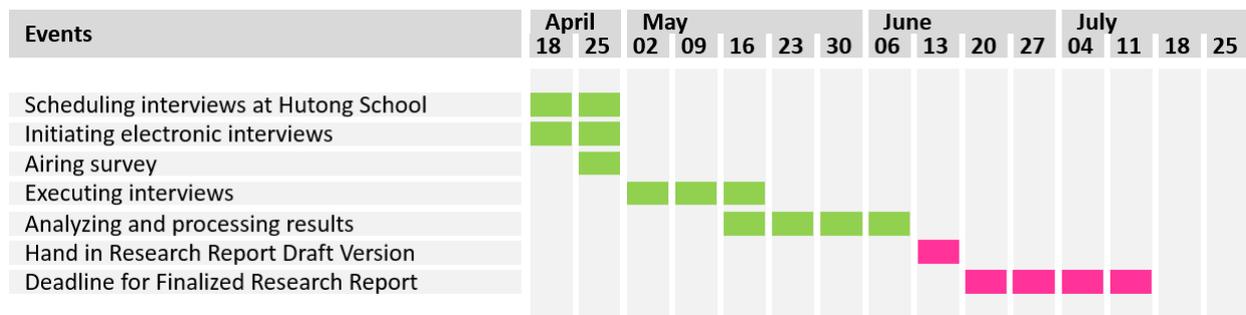
Image 5: Practical research phase planning

3.2.3 Survey variables

The survey investigated the following information.

<u>Basics</u>
- Age of student
- Level of preliminary Chinese proficiency
- Device usage and operating systems
- Hutong School program
- Profession (student, international businessmen, …)
- Mother tongue
- Foreign language the student masters at least in an advanced stage

These variables are necessary as the researcher will compare the preferences for and opinions about an app against the students' age, profession, the chosen Hutong School program and their mother language as differences are expected. For example, whereas intensive Chinese students usually wish to achieve a high level of Chinese very quickly including character writing and identification, internship students are usually more interested in being able to join conversations. In addition, differences are also expected for different age groups and profession, as well as the students' affinity towards foreign languages.

Consideration of using an app for
- Vocabulary learning
- Pronunciation practice
- Calligraphy practice
- Conversation practice
- Dictionary (including translation language preferences)

In this section, the preferences for using an app for various course contents are investigated. It may be likely, that students prefer an app as a dictionary and vocabulary learning, but would like to practice character writing with paper and pen.

Tests/assessments (outside class usage)
- Preference for digital quizzes
- Preference for digital assessments
- Preference for recognized digital certification exams

This section deals about the opportunities for an app usage outside the class like for training assessments and quizzes. Therefore, next to the variables above, the students are also asked about how many hours per week they learn outside, spend on other apps and if they would love to have additional training features as voluntary option or as a fixed program with "homework assignments".

Online courses
- Preference for doing online courses in advance to the Chinese immersion
- Preference for doing online courses during the Chinese immersion

This question is building up on the previous one. If students selected a fixed program with homework assignments (which equals a mix of online and actual courses), the student will be asked if he would follow online courses aside and in advance to his stay. If he opted for voluntary in the previous question, he will just be asked about the option of preparatory online courses.

Communication
- Preference for having activity features like in-class quizzes and in-class communication

3.2.4   Interviews with the education department of Hutong School

Whereas the survey reflected the opinion and demand of the students, the app also needs to comply with the teaching methodology of Hutong School. To ensure this and to explore how the app could be integrated into the core study material, several interviews had been executed.

First, an unstructured interview was held with the Education Manager of Hutong School. This interview researched in detail about the current teaching methods used for *Intensive Chinese classes* (20 hours weekly) and *Internship Chinese classes* (4 hours weekly) and how teachers got assigned to use study materials for their classes. The education manager, who is responsible for teaching methods and course concepts but also for teacher recruitment, is in close contact to the teachers and also to higher government boards like the Chinese education ministry or HSK administration. This person has therefore be seen as a key role in the qualitative research process.

Building up on the interview results, further semi-structured interviews were held with three teachers of Hutong School Shanghai. The teachers had been selected by the time they work for Hutong School, the amount of weekly hours they teach and the various classes. It is aimed to interview teachers who work already very long for Hutong School and are therefore familiar with the teaching methodology. Furthermore, it can be assumed that a teacher who is working for an organization for a very long time

complies with the corporate standards. Initially, the researcher wanted to interview only teachers with a minimum workload of 20 hours per week to ensure having enough in-class experience. This requirement stood in contrast to the fact of reflecting both primary Hutong School programs, as many teachers who teach IP students only work part time with around 8 to 12 hours per week. Therefore, the minimum workload has been disregarded and the researcher ensured to have teachers with more and less experience.

3.2.5 Interview questions

The interview with the education manager was an unstructured interview dealing about the following aspects. The transcript of the entire interview is accessible in Appendix 8.1.1

- What are the current study materials for each type of class?
- How strong is the balance between written and spoken language?
- How much variance is allowed to the teachers to design their lessons individually?
- How are pronunciation and tones practiced and what methodologies could help students to remember the right tones and its pronunciation?

Based on the results of this interview, semi-structured interviews had been set up. The aim of these interviews was to find out how teachers use the already existing study material and what kind of digital tools they may already integrate into their lessons. A transcript of an interview is accessible in Appendix 8.1.2

3.2.6 Interview with app developers and observations of existing apps

In a third step, the researcher contacted several app developers and tested already existing language and dictionary apps. The set of apps included *Skritter*® and *ChineseSkill* as representatives for popular vocabulary and language structure apps, *Pleco*® as an example for an advanced digital dictionary and *Memrise* due to its outstanding algorithm technology to memorize vocabulary. These companies had been contacted by email and questioned about background information based on their methodologies behind the app development. Qualitative useful answers have only been obtained from Skritter®, therefore the researcher made use of available information on the app companies' websites and tested the apps Pleco®, Memrise® and ChineseSkill on his smartphone.

3.3 Research credibility

3.3.1 Reliability

Surveys collect data in a comparatively rapid and systematic way. If sampling is applied correctly, the results are reliable based on the anticipated confidence level calculated in the research population sample. According to Saunders, Robson published four threats affecting the reliability in a negative way (Saunders, Lewis, & Thornhill, Research methods for business students, 2009). The first is called subject or participant error. Especially affecting opinion based results, it may happen that participants' opinion is different depending on external factors like weather or time. The most critical factor in this research was the interference with other surveys. Hutong School is conducting a monthly running customer satisfaction survey and during special occasions, other surveys are sent out. Students might have become overloaded with survey invitations which had an effect on the response rate.

Building up on this problem, researchers may also struggle with subject or participant bias where respondents tend to express the opinion they think they have to say. In addition, it is also not traceable whether the respondents completed the questions honestly. As this problem mostly occurs with surveys whose completion grants a reward, participants needed to be convinced of how their effort and their serious answers contribute to an improvement (Reichheld, 2013) rather than giving an

outlook of a reward or winning prize. Such bias however, could not have been detected in the survey results.

Finally, observer errors or bias may influence the research as well. Observer errors have their origin usually in the way the questions are formulated. Different questions may trigger different results. Furthermore, it must be ensured that the questions can actually deliver the desired content and can be generalized to the research population (Mora, 2011). Therefore, all questions have been presented to test persons similar to persons of the research sample first in order to exclude the potential of having unclear or unprecise questions. The researcher also ensured to ask neutral questions which did not contain any opinion already. Finally, the researcher also needed to take care about the way the data was interpreted. To avoid the probability of observer bias, the researcher concluded results under the supervision of the marketing manager of Hutong School.

During the interview conversations, further bias and errors can occur which may have negative influence on the quality and reliability of the data. Very likely are bias related to language issues. As the interviews had been held in English, a foreign language to both, the interviewer and the interviewee, it could have been likely that questions and answers could have been understood and interpreted in a different way than it was meant to be (Mark Saunders, 2009). To minimize this risk, the questions had been designed in a very basic and simple English level. In addition, the questions had also been available in written form during the interview. In addition, the interviewee used several visualizations to give answers like drawing schemes and overviews for a better understanding.

As these interviews were not anonymous, interviewees may had refused to speak about topics the researcher would like to explore as they feel they are not empowered to reveal such information. The interviewees received the questions and a topic explanations several days in advance to the interview to be able to review the questions and prepare their answers and had been asked in person if they would like to share their knowledge and opinion about this topic. The researcher also pointed out, that it is possible to decline the interview invitation without the need of stating a reason. However, all invited interviewees accepted the invitation.

Whereas the survey was mostly addressing to western people, the interviews were held with Chinese people. Therefore, cultural aspects relating to conversations in China had to be taken serious so that the interviewees felt comfortable during the conversations.

Obtaining results from the electronic interviews from app companies were the most critical factor within all data collection. Companies are generally not highly interested in sharing information that provides deeper insight into their products and development processes. In addition, the published information contains mostly only positive facts whereas potential threats are often disregarded. Therefore, the obtained information has been considered more as extraneous information rather than core material. The results have been compared to the results of the interviews with the education department.

3.3.2 Validity

The research validity splits up into internal validity and external validity. Internal validity can be described as indicating the confidence of a cause and effect relationship. The main target is that when analysing the results, that the cause which is responsible for the measured results can be undoubtedly supposed. This means, the researcher must be sure that alternative causes that could lead to the same outcome have been eliminated (Shuttleworth, 2009). Such issues are usually caused by the

history or the people involved in the research process. If, for example, in media would be communicated that language apps slow down the learning progress this would have a serious influence on the responses of the participants. Therefore, the media environment about topics related to language apps has been checked. No extraordinary situations occurred that could influence the research's validity.

External validity focuses on the generalizability of the results. A high external validity indicates that the results that have been withdrawn from the executed research can be generalized to the entire research population. In the survey, students' opinion is collected. Only if the survey participants are representative for the majority of Hutong School students, the results from the survey can be generalized and it can be said that the results are valid for the majority of Hutong School students (Shuttleworth, External Validity - Generalizing Results in Research, 2009).

3.3.3   Generalizability

To generalize research results, the research design must be planned well including a sample that represents the population accordingly. In addition, the researcher also needs to understand the environment in which the study has taken place. This means the researcher needs to think about whether results from the survey, but also from the interviews would be the same if these practical researches had been executed under different circumstances. If, for example, the education manager had not been available for an interview and the researcher had interviewed the teaching coordinator, would the results be the same? The same may apply to the interviews with the Hutong School teachers. Although the teachers have been selected by certain criteria and the teaching concepts are standardized, it can be supposed that everyone brings a little personalization in his job and it is therefore likely, that asking three different teachers would have generated different results.

However, this part is often difficult to predict. Therefore, it is quite common that once results of an initial study are revealed, continuing studies with similar, but not identical conditions, are executed to find out whether and to what extend results are stable and do not depend on the way they are collected (generalizability | Institute for Work & Health, 2006).

In this case, it can be said that at least some of the results can be generalized. The results from the interview about the teaching methodology are generalizable since the researcher could experience real classes and see that teachers are designing the lessons according to the standards. The results from the survey could have been generalized if the response rate had been higher since the sample was representative. The results from the interview with the teachers can be generalized to all classes taught by these teachers and may also be slightly generalized to other teachers since many teachers share ideas.

The results from the interview with Skritter® and the observations while testing several apps, are not generalizable since the results are dependent on the specific app and the way the researcher tested the app.

As the business sector is very dynamic with immediate changes, the student population of Hutong School can differ over time. In this case, follow-up research needs to be executed to ensure that the results are also valid to any modifications. In the event that externalities are changing, e.g. Hutong School would modify its teaching concept, the research result may become partially obsolete.

3.4　Data collection

The students' opinion about using an app during their Chinese classes as primary study material could have been obtained through several instruments. Experiments could not have been applied as this type of instrument required at least a prototype of the app. Interviews are an option to obtain qualitative data and, if well structured, highly reliable data. However, students are usually at Hutong School for their Chinese classes with short breaks in between only. Therefore, it could have been problematic to approach a sufficient amount of students with enough time for an interview. This aggravates representing the Hutong School population accordingly.

Whereas an interview requires much time, a survey is also collecting opinion, but works more convenient. It has been seen as the ideal instrument for collecting the students' opinion as surveys allow a lot of automatization when it comes to data processing. A survey usually needs to be created and formatted only once and is available for the entire period needed. In addition, it allows to withdraw generalizations since the research conditions had been more or less the same for all participants. A survey is mostly very cheap and is very flexible in terms of workload as only the creation and the analysis requires manual work whereas the data collection phase is running automatically.

To obtain further qualitative insight into teaching methods of Hutong School and the opinion of selected teachers towards how they can design their lessons using the study material app, interviews have been considered the most efficient way. The above mentioned disadvantages did not apply to a very small research population as interviews with a couple of people is absolutely feasible in terms of time and costs. In addition, Hutong School employees are easier to approach as they usually spend more time in the facilities than the students.

Obtaining further background knowledge about methodologies and principles behind existing language apps have been collected by electronic interviews. Selected app companies had been contacted by email and received a set of questions, next to a full introduction to the research project and the lookout to a potential cooperation. Although motivating the companies with a positive lookout, the researcher was aware that response rates in contacting companies can sometimes be very low and he therefore had to expect not receiving sufficient material. Indeed, only one company, *Skritter*, provided qualitatively useful answers.

3.5　Research ethics

The survey was anonymous and was not asking for personal information other than the age. The survey results had been anonymized and cannot be traced back to individual persons. All names and email addresses that had been collected to approach students and had been saved by the survey provider *surveymonkey*, had been deleted. Furthermore, the survey was asking for the students' opinions about a future tool and was not inquiring any sensitive data like study progress, results or contact details. During the process, the data had been kept confidential and secured in a way that individual answers had not been visible. After the results had been published, the data set will be transferred to the Marketing Manager of Hutong School who will store the data in accordance with Hutong School's data storage standards to which students agree with their application. All participants had been informed about how their data will be processed at the beginning of the survey and had the right to refuse participation. Furthermore, students had been provided with an email address where they could contact the researcher to opt-out from any collector.

All interviewees received a detailed explanation about the purpose of the research project and how there information is processed and stored in written form.

3.6   Research sample

3.6.1   The calculation

In order to obtain the research sample, stratified representative (probability) sampling techniques are used as the researcher wants to ensure that the results of the sample are representative to the entire research population which is stratified by the locations Beijing and Shanghai (Rooduijn & Loon). Students following a program at Chengdu had been neglected as programs offered at this location currently do not offer any language classes.

The sample size has been calculated based on the research population, the margin of error, the confidence level and the standard deviation. The margin of error indicates how much higher or lower the sample mean is allowed to differentiate from the population mean. The confidence level indicates the probability that the actual mean will fall within the confidence interval (Scott Smith, 2013).

3.6.2   The research population

The research target population equalled the amount of students at Hutong School followed either the *Intensive Chinese Program* or the *Internship Program* or following a custom program which contains Chinese classes. The accessible population is the amount of students which was attending at least one of the above programs during the research period (May 3 – May 20). From the accessible population, the research sample has been calculated (Explorable.com, 2009).

	Intensive Chinese		Internship		Total	
Beijing	7	6.93%	30	29.70%	37	36.63%
Shanghai	14	13.86%	50	49.50%	64	63.37%
Total	21	20.79%	80	79.20%	101	100,00%

Table 1: Accessible population – Hutong School students in April 2016
Please note that this information is confidential.
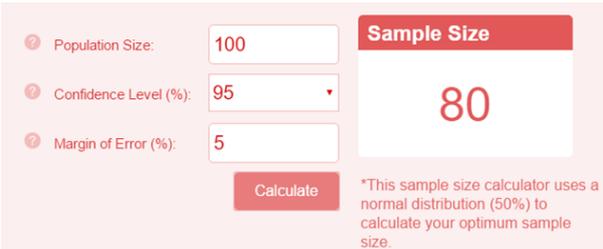
Image 6: Surveymonkey sample calculator

As previous studies in this topic field for Hutong School did not exist, the sample size was calculated with commonly used factors for margin of error, confidence level and standard deviation (Surveymonkey, n.d.). The calculated total sample size is 81 which means that 81 respondents are needed, stratified in the following way.

	Intensive Chinese		Internship		Total	
Beijing	5	6.93%	24	29.70%	29	36.63%
Shanghai	10	13.86%	40	49.50%	51	63.37%
Total	15	20.79%	64	79.20%	~81	100,00%

Table 2: Ideal research sample

3.6.3   Population approach

The students had been approached by personal email invitations sent out through the *surveymonkey* collector. The data had been accessed through the CRM system from Hutong School. Furthermore,

students have been approached personally during the first break between classes (usually 10 AM) and at selected activities for further motivation to complete the survey.

The teachers and the education manager had been approached personally and interview appointments had been scheduled.

3.7   Transformation

The practical research is based on the locations in Beijing and Shanghai, Hutong School's locations in China that offer Chinese language courses. Students who attended a program with Hutong School but did not follow Chinese classes had been excluded from the research population and hence, from the population sample. As the survey is differentiating results from beginner students and students with Chinese knowledge, the results may also be applicable for Hutong School's locations outside China (currently Brussels and London), which are primary used to offer beginner classes in preparation to a stay in China. Important to mention is that most of the students come from European countries and therefore, the learning culture at Hutong School classes in China may not differ much from classes in Brussels or London. The interviews had been held in Shanghai. As the teaching methods in Shanghai and Beijing are identical, the results of the interviews are also applicable to language classes in Beijing.

3.8   Survey platform

Chinese government is applying its "Great Firewall of China" disabling access to many websites and online services, for example all Google® products. Although there are unofficial ways to gain access to these contents, it is illegal (Agencia EFE, 2015) and should therefore not be used as this can have negative effects on the response rate, but may also be fined. It also need to be added that the internet infrastructure in China is intentionally built in a way that connections to servers outside China are very slow due to a very low bandwidth whereas domestic internet connections are sometimes of even higher quality than in many western countries. Therefore, a Chinese provider has been seen of advantage in terms of convenient access. However, in terms of data procession, a well-established provider offering a reliable software (preferably in English) was crucial. In addition, Hutong School possesses a paid *surveymonkey* account and is running several surveys through this account. Therefore, it has been chosen to use *surveymonkey* as survey provider. The survey has been set up and has been tested on devices featuring VPN software and devices without any VPN. On both devices, the page loading time was acceptable and the survey has loaded correctly.

The results have been processed in two stages. As the survey provider allowed to export results in MS Excel, a spreadsheet had been downloaded and modified to contain only necessary information. After that, this modified document had be imported to SPSS Statistics to create graphs and correlations to identify the most important and most surprising findings. Some graphs have been created with the help of *surveymonkey* results analysis software and some graphs have been created with SPSS.

4   Results

4.1   app features

The survey demonstrating the opinion of the students delivered the following results.

4.1.1   Course contents
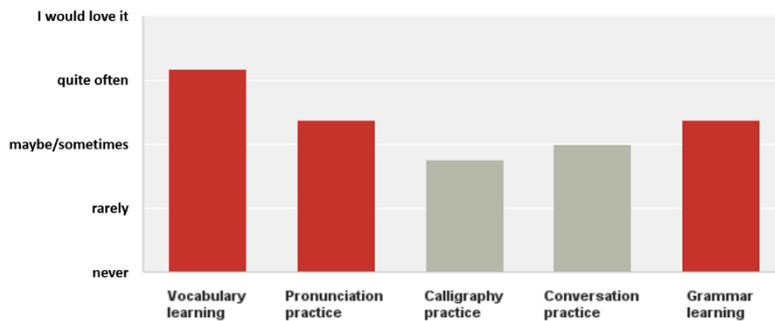
Image 7: Students'preferences for different course contents

According to the survey results, the app should feature content to practice vocabulary, pronunciation and grammar learning. Character calligraphy and conversation making can be neglected. The interview with the education manager showed that teachers are asked to show students pictures of objects or activities the students shall learn to express in Chinese. A vocabulary collection with images could help to standardize the course content and make the lesson preparation for the teachers easier.

4.1.2   Outside class usage
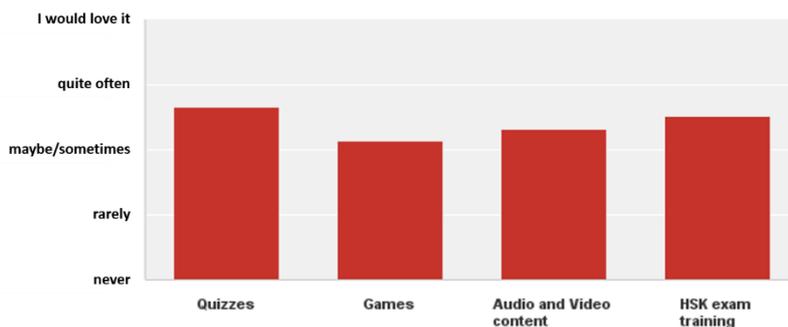
Image 8: Outside class usage of an app for different contents

In addition to using an app during classes as study material, students are generally highly interested in using an app outside classes. Currently, Hutong School offers its students selected app products for free or for a reduced price. According to the survey, students are interested into quizzes and HSK exam training, followed by audio and video contents that have been requested generally by more advanced students. The Games section scores last and is therefore least important to Hutong School students. Audio and Video content, especially Chinese news clips and a selection of Chinese TV series was also requested by students in an open comment field in the survey. This matches with the findings of the study at University of Edinburgh about singing songs in the language that should be learned where students who listened and sang to songs experienced a quicker and more intensive progress.

Teachers mentioned during the interviews that executing quizzes, assessments digitally through the phone will have several advantages. Next to the fact that it may be a great homework assignment as it allows students to complete at the time they prefer, it is also a lot easier to write as students can type in Pinyin and will receive the characters through the software.

4.1.3   Dictionary services
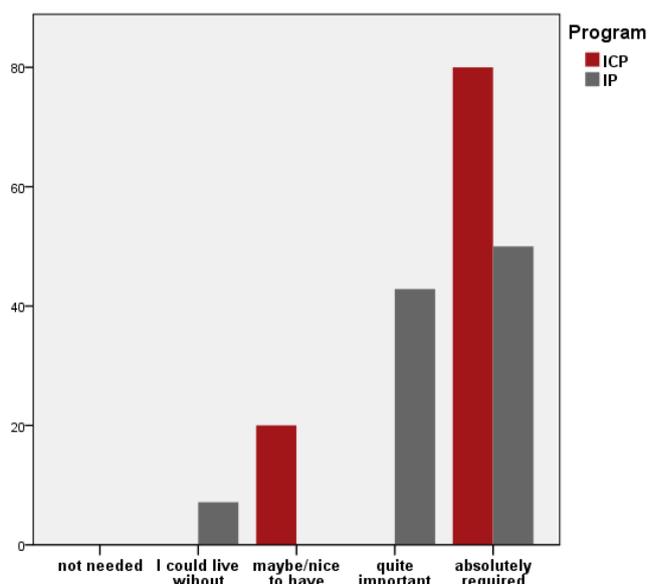
Image 9: Preferences for a dictionary in percentages by program

Students expressed a very high demand for dictionary services. Around 80% of students following the *Intensive Chinese Program* (ICP) stated that a dictionary would absolutely be required. A stratification by previous Chinese level did not show any valid correlation. Therefore, it could not be proven that students with a higher previous Chinese level would either more or less use dictionary functions.

According to the survey, the most important languages the dictionary should translate to are English, followed by German, French and Dutch. It was expected that French and Dutch enjoy a higher preference due to the fact that a majority of Hutong School students is French or Belgian, but there is generally a lower amount of students from a German speaking country.

According to the interviews, a good digital dictionary for Chinese should cope with characters (traditional and simplified), Pinyin and real voice pronunciation. Students and teachers mention that some dictionaries offer the possibility to import a picture of written text and the software recognizes the characters and delivers a translation. This feature comes in very handy for students when they are exploring the city. With such a feature, it is possible to read and understand restaurant menus, signs and descriptions etc. Highly advanced software like the Google Translator App is able to allow spoken words as language input next to written text on an image. Google advertises to be able to translate an entire conversation, although the translations may not entirely be correct. However, the Google translator app is learning based on the specific translation users choose from the list of results. Advanced software, like Pleco® contains a bundle of licensed reliable dictionary databases as a combination of several sources enriches the dictionary's vocabulary and thesaurus.

4.1.4   Online courses
In the survey, students had been asked if they wish to have online courses in advance and/or in addition to their Chinese immersion. Although in general, a slight majority of students expressed the wish of having this offer, there is no clearly spottable correlation.

Online courses	never	unlikely	maybe	likely	for sure
~ in advance to China	9.52	9.52	28.57	28.57	23.81
~ in addition	9.52	9.52	28.57	28.57	23.81
~ replacing 50% of classes	33.33	33.33	19.05	4.76	9.52

Table 3: Preferences for online courses bin percentage per type of course

The researcher expected that especially *Internship* students could be interested in both, preparatory language courses or additional language courses, as there time in China is basically taken by the internship. Surprisingly, internship students did not show a very huge interest into online courses and their preferences did not much differentiate from Intensive Chinese students.

4.1.5   Communication & feedback

Legend:
- Yes, in addition to the weekly tutorial sessions
- Yes, instead of the weekly tutorial sessions
- No, I prefer having weekly tutorial sessions only
- I am not interested in feedback
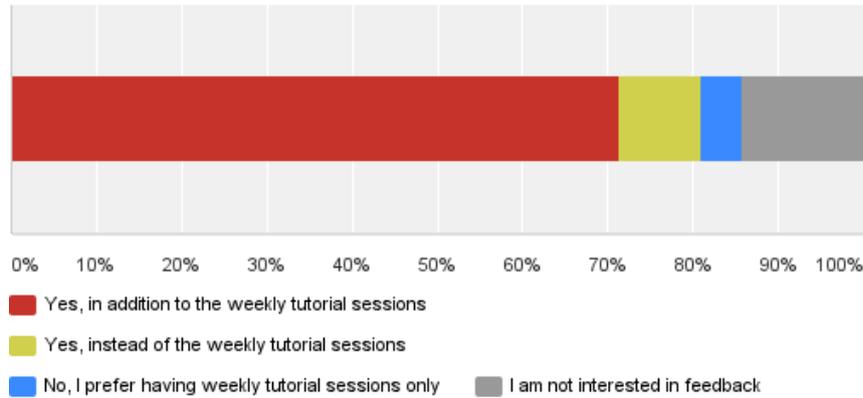
Image 10: Communication preferences

In the survey, students had been asked whether they would like to receive feedback on their learning progress by the help of the app. Currently, students have the opportunity to consult twice a week a teacher to practice talking and become feedback on their progress. The results stated that more than 71 percent of all students wished to have feedback through the app in addition to the weekly feedback sessions. Dividing by the type of program, the survey results deliver that around 87% of interns wish to have additionally feedback and 60% of the ICP students.

According to the interviews, the two sessions per week are primarily used to give the students an additional opportunity to talk and receive personal feedback. This extra service although, is offered by Hutong School out of marketing reasons. The survey showed that, however, students are generally open to receive feedback, especially when it can be obtained in a convenient way. Giving feedback can be executed fully automated if the app is recording the learning algorithms paired with the success rate when doing quizzes or assessments. For example, Chinese Skill offers exercises to build a character based from given strokes. Alternatively, the character can also painted completely without any help. In addition, feedback can be given through the teacher who may also apply interactive functions like quizzes and assessments and obtain automated grading support from the software.

Existing apps to learn languages often feature kind of communication modes like competing with friends or even unknown people (like high score lists in online games). Hutong School students have been asked if they wish to have such features integrated into the app as well. According to the survey, the majority of the students evaluated such a feature as a "nice to have" item, but it is not necessary.

According to the interviews with teachers, it is difficult to keep all students at the same level as students differentiate in their effort and engagement. Some work really hard and want to achieve high results whereas some students are in this program because they want to enjoy their time in Asia and just want to learn the language a little bit. As all students are customers, all their needs must be respected. When rewarding highly motivated students, those being below average may be discouraged and may start to dislike their class or program.

4.1.6   Operation system

There is a slight majority of Android operated devices over Apple operational systems. A minority of Hutong School students was using a device operating with a third operation system which is based on Android. This is a typical appearance for Chinese branded phones as due to the censorship of Google products, these phone come with a company-operated OS and App store (like MIUI for Xiaomi 小米 or Color OS for Oppo).
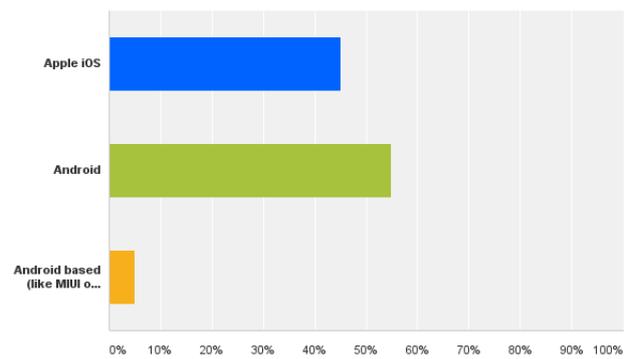

Image 11: Students' operation systems on devices in percentage

4.2   Teaching concepts for Chinese

4.2.1   Lesson design

The interview with the education manager showed that a lesson consists of three different parts. The introduction of the lesson should deal about a current topic happening in China. This can be about a holiday, something out of the media or even an event of the daily life. This introductory part should not last longer than one minute. Ideally, the introduction matches the topic of this day's course/lesson. The introduction can be made with a picture, a statement from the media or even a real object.

The main part of the lesson follows the introduction. In this part, the teacher should cover important aspects of the language structure (particles, word order, quantitative words etc.). The teacher will start with an explanation followed by examples. Students shall read and repeat the examples first and then come up with their own examples. In beginner classes, the teacher needs to provide a lot of vocabulary whereas more advanced students shall apply already learned vocabulary. Building up on this exercise, students shall now develop sentences of the same structure in a similar topic. If, for example, the topic was recently eaten food, students can now move on to recently performed activities, as in both cases, the sentence structure will be the same. According to the education manager and the teachers, repetition is important. Therefore, students shall try to recognize the patterns in sentence structures to correctly learn the word order from the very beginning. To conclude the main part, the teacher shall ask the five W questions (who, what, where… etc.) to practice also how to ask about specific topics and how to answer in both variations, positive and negative.

To conclude the lesson, the teacher shall organize a real situation to give the students the opportunity for self-expression and free speaking for example in a roleplay. This situation is the summary of the lesson, therefore, students shall apply again the acquired skills and vocabulary of the lesson.

4.2.2   Strong study plan

The interview with the education manager of Hutong School revealed that teachers are advised to follow the course concepts and study plan of Hutong School and do not improvise and variate a lot. Of course, teachers shall respect students' individual wishes but the higher priority is to stick to the study plan. Drifting off the concept too far or too often can cause students to lose the overview which is likely to result in a slower progress.

4.2.3   Character separation

According to the education manager, Hutong School introduced a teaching method which separates the character writing from spoken Chinese and pinyin. This decision has been made as students at Hutong School stay a comparatively short time (average three to six months) compared to students studying the language at university for three to four years. To ensure that students make quick progress, the program must be designed in a very efficient way. This method allows a very fast progress in conversation and pinyin. Thanks to smartphones, students are able to type in pinyin and select characters and can this way, for example, chat with Chinese friends.

4.2.4   Keeping standards and transparency

If the app will be set up in a way that every teacher gets assigned a virtual classroom and students need to sign into that classroom like it is already practice on several teaching platforms like Edmodo, Moodle or Coursera, the app administrator can keep supervision of the activities. This means that he has visibility about all classes and there performance and progress and can guide or interfere if necessary. It also enables the education manager to place arriving students with a previous Chinese level in a suitable course.

4.2.5   Using existing media

Teachers mentioned during the interviews that they make already use of interactive and technological functions in their classes. Some teachers make use of physical games or flashcards, some use devices to show pictures or video clips and some use already existing apps or Podcasts, like *WeChat* or *ChinesePod*. *WeChat* is a Chinese messenger app (similar to *WhatsApp*) which also allows voice messages. This way, the teacher has several communications with the students either by talking or by typing and can give instant feedback.

4.3   Observations from testing existing apps

4.3.1   Alternative input options

Google translating services offers a voice input. Sound software is able to identify the word and can of course translate it, but may also give a correction on the pronunciation. So far this feature is highly advanced and is not yet standard in language apps.

4.3.2   Reading, testing, repeating

The app *Memrise®* is generally built on progress goals. The default goal when learning Chinese is to learn five new words daily. The app software realizes mistakes and forces repetition until the user gets all words correctly. In its "About" section, the app developer states that *Memrise* is based on three principles: elaborate encoding, choreographed testing and scheduled reminders. The app tries to build several connections with the learned material so that the brain can easier remember the new words. An even higher success will be achieved through testing. Several test methods like multiple choice tests, gap filling tests with no answer options and completion tests where a set of letters is already available boost the performance as it requires more connections in the human brain as it is more effortful to recall an answer in a quiz than simply reviewing a vocabulary list.

Paired with frequent repetition, the human brain is likely to classify the new learned material as important and the probability of remembering increases. Some teachers make already use of this strategy as they frequently test and challenge their students and expect them to remember at least 90 to 95 percent before they will move on to new topics.

4.3.3   Splitting up characters

According to Pleco®, an upscale dictionary app, splitting up characters into their individual characters helps students to recognize the patterns and remember characters. Therefore, the software has such a feature integrated named cross-referencing. Being able to identify the radical will help students to estimate the meaning. Paired with the other components of a character, the student may be able to also guess the pronunciation after several practice and repetition.

Another useful tool is the stoke correction, offered by the app "Skritter". This tool will correct instantly the user's handwriting when drawing any character. This tool combined with the stroke-order help are, according to the app publisher great functions to practice character writing.

5 Discussion

5.1 Research comparisons

The primary research question identifying the requirements for a potential, future Hutong School study app that shall be used as study material for classes could have been answered. The literature study already revealed several important aspects that do somehow match, but also stand in contrast to the findings of the practical research.

Toshniwal, CEO of Y Media Apps, stated that very good apps usually focus on a very few user aspects rather than offering a broad portfolio of services. The reason for that is usually that apps offering several services require a lot of storage space and CPU which causes the app to perform slow on older or poorer equipped devices. For Hutong School, that could mean that if the app already features all the lesson contents including the vocabulary training, integrating a full dictionary and extra quizzes may be too much. A compromise solution would be to not offer all contents offline. Hutong School may focus on the most important contents only which are available offline and any additional items need to be downloaded by the user. This means, that users who wish to have an offline dictionary, can download it in-app whereas others can decide not to download any additional content and will connect to the app database for every single translation request.

That stands in contrast to the learning principles demonstrated by Hauser. She suggested to immerse with the Chinese environment and efficiently look up words in a dictionary. If, for example, students go shopping and see 新品上市, they could look these words up and learn that here is the section of the "new arrivals" products. According to Hauser, it is more likely to remember new vocabulary compared to the traditional way or using flash cards since there is a connection with the everyday life. Combining these two theories, Hutong School may think of developing a study app in addition to a dictionary app.

A separated dictionary app may be purchased more likely from a white label company than the study app. According to McLandress, white label purchases still offer a lot of interface customization so the app can be adapted to the corporate branding of the publisher. The study app is completely adjusted to the teaching concepts of Hutong School and it may therefore be difficult to find a white label product. The dictionary however, is a more standard app product and it can be more likely to find a suitable white label product.

White label apps may be definitively an advantage when it comes to app security. Apart from having a support team that is constantly working to ensure the app runs stable and stays compatible with new operation systems, the team also protects the app user from potential viruses, data leakages and other security issues and have to take responsibility. According to Panda, independent app developers often underestimate or disregard security issues since they do not expect any problems with apps that do not collect sensitive data (like for example online banking apps do). However, every app can be a potential transmitter of viruses and malware. According to Lee, Trojans and other malware scan the "host device" for any kind of personal data, but use several ways to get copied on to other devices. That can happen through emails, SMS or chat messages, but also through other apps installed on the phone. That means, if the Hutong School study app features any kind of communication, it must be regarded as an app with sensitive content and security issues shall not be underestimated.

5.2 Limitations

5.2.1 Survey low response rate

Unfortunately, the survey response rate was not that high as expected. Although the researcher had reminded the students three times and actively approached them, a high response rate could not have been achieved. The actual response rate was 26.25 %. This had several negative influences on the research results. Originally, it has been planned to apply interferential statistics to identify whether there exist correlations with app preferences and personal details of the Hutong School students (like age, native language, etc.). However, a very low response rate results in too few responses per category which does not allow to execute a regression analysis with a valid factor that would allow predictions or forecast estimations.

In addition, a low response rate may distort the initial sample making it less representative. A less or non-representative sample results in a not according reflection of the Hutong School students. Potential strategies to compensate this low response rate are mentioned in the section for continuing research opportunities.

The reason for such a low response rate may be that students were also invited once a month to a customer satisfaction survey and too many survey invitations may cause students to feel spammed. In addition, internship students spend nearly all their week at the host company working and may therefore not have much time. To conclude, asking for students' opinion should be done different in the future to achieve higher response rates. For example, students can be asked only one or two questions in person when arriving at school before a class starts or during a coffee break. Whereas an entire survey of 15 questions requires several minutes of attention, a single question can be answered within a few seconds

5.2.2 Problems with replies from app publishers

It seemed to be nearly impossible to receive answers of higher quality from app publishing companies. Many companies did not react on the request and did not share any kind of knowledge. The researcher therefore has changed the approach and used all available information from the website and tested available apps on his smartphone. Although the attempt to replace missing replies with testing the apps and using information from the website, information about methodological principles about learning Chinese are missing. However, that may leave room for further research, once the app development plans of Hutong School become more detailed.

5.3 Opportunities for continuative research

5.3.1 Intensifying students' opinion

To obtain more insight about the students' opinion and gain results with a higher validity and generalizability, continuing studies can be done. It is possible to run an experiment on students where different apps can be tested and after a certain period of time (for example 4 weeks), there progress will be measured. The experiment set up requires students of the same Chinese level (ideally all beginners). To ensure students are still reaching the promised level of the program, the app shall only be applied in addition to the current study material. This experiment may be repeated several times with different students to obtain more reliable data. As some apps do not offer free versions or only very limited light versions, this experiment may cause several costs. This experiment will not reflect the opinion of the students, it will rather allow to draw a correlation between the study progress and the specific app used as secondary study material. A potential threat to that experiment is the lack of

control about the self-study of students. For valid results, students should all make the same time investment and must not use any additional tools. Although the results would be very beneficial, it is rather unrealistic to find students willing to join such an experiment after paying for a language course. Offering participants free classes would generate more costs, as classrooms and teachers need to be provided without making direct revenue.

A second opportunity would be to introduce several existing apps during the language classes whereas each app will be used only for one week. After each week, students may fill out a very short questionnaire about the app they have used. This set up will reflect the opinion of the students and if the applied apps differ in functions, it may be possible to gather the desired functions from the apps that have been most enjoyed by the students. This research instrument is easier to conduct than the experiment, however, it is dependent on the students filling out the questionnaire every week and bears, similar to the survey, the risk of a low response rate.

5.3.2   Obtaining more app insight

The technical development of an app has not yet covered sufficiently with this research. This step is usually elaborated on once the requirements are determined as a developer needs to know what functions his app needs to cover before he can really start caring about the technical details.

It may be possible to find several apps that have similar functions and work the same way as the desired Hutong School app. These apps can then by analysed based on their technical specifications like size, system requirements etc. and their developers. Such a kind of study will create a first, broad overview but it is unlikely to find detailed information with this strategy. To find more detailed information, having contact with app developing companies or independent developers seems unavoidable.

5.3.3   Budgeting

This research project excluded any kind of cost analysis since the idea of an app is still at its very early stage and there are too many open questions that needs to be answered first before a study about costs can be executed.

Once Hutong School decided on the exact appearance of the app (requirements), it is possible to send the requirements specification and a project description to app development companies, asking for a price quote. It is important to select both, white label and independent developers and also to include future support fees for updates etc. into the quote, to be able to compare the costs for both models.

6   Conclusion and recommendation

6.1   Conclusion

When learning languages, comprehensiveness is as important as repetition. It is expected to make faster results when learning in fixed intervals. New learning material shall be split up in small parts. Those parts need to be repeated very often with a gradual decline in frequency. Instant quizzes after a certain time period can determine which parts are still perfectly remembered and which parts need more practise. In addition, it is crucial to follow one logical order as it is easier to remember things that share the same context. These two are both factors where apps can become pretty handy as not only can the learning order be defined and access to contents can be restricted, but also students find it more convenient to study with an app outside classes as it is more practical.

Successful language apps track the learners daily (or weekly) performance and based on several algorithms, they suggest what to learn next and how much time to spend for that, in addition to setting personal goals. Keeping these deadlines results in rewards. Although these rewards are points or medals and cannot be redeemed for cash, they shall enhance the motivation.

According to the practical research, the most important topics students prefer in an app are vocabulary, pronunciation practice and grammar learning. Students and teachers wish to have further functions like quizzes, assessments and audio and video contents. That goes conform to the new teaching concepts of having more interactive lessons and require students to do all necessary self-study parts at home. Teachers stated that with digital quizzes and assessments, students can do homework at a time and a place convenient to them. In addition, students may solve writing tasks easier and quicker as they can type in pinyin. In addition, testing grants faster results than just reading the information as the brain is more challenged and therefore more active.

Feedback is very important to students and shall not lose in value by using apps to study. Whereas an app can give automatic, instant feedback about small task like handwriting correction, it cannot replace a teacher who can give personal advice. However, the app can, by collecting much more data than a teacher could do, can support the teacher by providing performance results and statistics of the entire group and individual students, filtered by selected assignments or a certain period of time.

Existing language study apps make use of tools and functions that can never be executed by a teacher, the automated study load recommendation. The app Skritter provides an items due list which recommends the daily study load. Items in the list can become overdue if the student made a too long pause of using it. The amount of items in that list and the frequency is calculated based on the students' appliance of the app and his or her performance. According to the app publisher, it is crucial to study the amount of items as long as they are due and not overdue.

6.2　Recommendation

Following is a requirements list for the future Hutong School app.

6.2.1　General lesson set up

lesson content:　　　　　All lesson contents of the book in the order as designed in the course concepts. Each lesson should contain several methods of testing like quizzes and assessments for both situations, in class and outside classroom (homework). A typical lesson could appear like this

1) Opening (introduction to the topic with fun fact, a famous Chinese object or food dish unknown to foreigners, an activity etc.)
2) Lesson text
3) Structure rules (here, the new grammar will be explained with theory and examples)
4) Activity for students (quiz, roleplay, assessment)

Self study:
5) Repetition of new learned skills with further quizzes and assessments)
6) New vocabulary for next lesson

Lessons need to be completed with sufficient results before another lesson can be started. The education manager and/or administrator of the app should be able to set up restrictions, but teachers should also have little flexibility to suit their lessons to the students needs.

vocabulary:　　　　　　Suitable vocabulary for each lesson content. The vocabulary should be accessible in advance to the lesson so students can prepare the new words to be able to follow the text and conversations in the following lesson. Vocabulary quizzes can help to remember and should be applied.

6.2.2　Front end development

menu navigation &　　　Many apps have a menu bar at the bottom. A simple navigation is important
check in　　　　　　　　to avoid that students loose time in their classes by searching a link to specific content. An example could be to provide four major sections.

1) Lessons
2) Homework
3) Additional exercises/tests (always accessible)
4) Configurations/Settings

Students shall be easy to check into a class. This may be possible with a QR code. The teacher opens a class on his device and the students scan the code to join.

Being now paired with the teacher, the app will manage which content the students can access.

character reading:　　　A tool to decompose characters in their individual parts to make it easier to identify the meaning and the pronunciation. In addition, the tone need to be

indicated and ideally, the character should be spoken by a Chinese native speaker, ideally both, isolated and in an example sentence. For many characters, it is possible to make up, as in some characters, the actual meaning can be seen with a little help of imagination, other character have some "fun facts" in their historic development etc. These kinds of stories form more connections in the brain and it is possible to remember the character better. An example is the character 工 which means *work*. The character for *king* is 王, which can be easily remembered since for a king, work is unsuitable, therefore *work* has been crossed out.

6.2.3   Back end development

pronunciation:

A voice output of a Chinese speaker for every character should be given. If a manual audio recording may be too inconvenient, automated services do also exist like Google Translator services and Nuance vocalizer. The software should also allow a student to record his/her own pronunciation and compare to the software input. Depending on the variation, instant feedback can be given with respect to the tone.

character writing:

A tool that gives instant stroke correction when writing characters like in *Skritter*. ChineseSkill uses motion-pictures for several characters to demonstrate the stroke order and stroke directions. Ideally, a student should watch an animated demonstration of the character writing first and then try to write it having instant stroke correction. In a third stage, the student should be tested by writing the character without any support.

digital assessment:

Teachers, as well as the education management should be able to set up some quizzes and assessments such as gap-filling texts, vocabulary quizzes, character writing etc. These quizzes and assessments must only need to be designed once and can be used for many classes.

feedback:

The app should be able to measure the score based on the digital assessments and the lesson progress. It may be possible to reward students with virtual credits that will be obtained for each completed lesson. The app can track the students daily study load and calculate his or her progress speed based on the amount of correctly completed lessons/quizzes.

administration

Each class should be registered so that an administrator of the app has insight into all classes and their progress. This can improve customer service and will also generate a lot of customer insight. Collecting personal data along with the students' progress enables the administrator to find correlations between variables like student age, nationality, other language skills and their progress. This might be beneficial to know when grouping students to classes and allocate teachers.

Second, the administrator can constantly track the progress and compare it. Ideally, classes that started at the same time should make the same progress over a certain period. If, for example one group seems to be significantly

slower, the administrator can interfere and take measures to increase this group's performance before students start to complain (which would decrease customer satisfaction). Finally, it grants Hutong School more flexibility and students may arrive anytime during the year since the administrator can constantly see the progress of each class and find a suitable group for new arriving students more easily.

operation system: iOS and Android. There was a slight majority of Android operated devices. However, excluding a major platform like Apple iOS would make the app not suitable as a standard study tool.

6.2.4   Separate app

dictionary: A dictionary from Chinese to English and vice versa. Chinese input should be pinyin and handwriting recognition, ideally with stroke-order tolerance. Advanced input would be voice recognition and picture upload/input so that announcements or written text in public places can be translated easily as well.

This feature is preferably available through a separate app. This allows students to reach the dictionary function faster as it is not necessary to navigate through the app menu. While in class, the study app contains the necessary vocabulary.

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8   Appendix

8.1   Interview transcripts

8.1.1   Interview with Hutong School education manager

Hutong School builds on the teaching methods applying the separation of spoken Chinese and written characters. Does this apply only to beginners or also to more advanced people?

In general, this teaching method has been designed for beginners to be able to do a very quick progress, especially in spoken Chinese. Character introduction takes usually much more time as western students are not used to such a system. People coming to Hutong School with advanced Chinese skills are usually free to choose what they prefer and can also focus on characters.

At which stage are characters taught?

For ICP students, an introduction to characters will be made after 40 hours (usually 2 weeks). However, classes will split up then and students learn characters, but do still continue also with Pinyin expressions to obtain a rich thesaurus very quickly. IP students do not have such a fixed schedule as those students have more variating needs depending on their expectations, future career plans and also their internship position. Internship students staying only for three months or even shorter will usually not introduced to many characters as the short time does not allow an intensive introduction.

How are Intensive Chinese students learning spoken Chinese?

A typical lesson is designed that the teacher shall start with a current fact or also an activity. This can be from the news or also relating to situations happening in the daily life of students. The teacher shall tell this fact in Chinese and translate it to the students. Then, the students shall repeat this fact. If the students become more advanced, the students can replace the teacher's part and can present a quick news fact at the beginning of a lesson. Ideally, the introduction part is matching with the following course content. If, for example, the 了 particle should be learned, then the teacher can ask about what the students have done recently or during the weekend etc. The second part of the lesson is the main part where the language structure will be learned. The lecture becomes introduced and the teacher shall provide the students with examples. Students shall first listen to the examples and then read the examples at least three times trying to understand as much as possible before the teacher provides explanation. This way it is more likely to remember the sentence structure and understand the logic of the language. In a second step, the students shall come up with own examples. In the beginning, the teacher will provide several vocabulary, more advanced students shall try to apply recently learned vocabulary. After this, students shall develop similar sentences containing the same structure, but dealing about another topic. When for example the first exercise was to talk about recently eaten food, then it can now be talked about recently done activities. The teacher may also encourage students to ask themselves questions and answer them. The teacher can ask the five W questions and let the students answer them in both ways (Yes and No) and the other way round. Repeating these questions in every lesson is important to build questions in the daily conversation. In a third stage, the teacher should organize a real situation where students can express themselves (like in a roleplay). This is the summary of the lesson where the students apply ideally the recently learned skills and vocabulary.

Why chose Hutong School the separation methodology?

Hutong School needs to teach Chinese efficiently as it is short-term programs (usually 3 – 6 months) compared to programs at University (up to 4 year duration). With this method, students will have a quicker progress in the beginning stage and will be able to communicate with Chinese pretty soon although, they cannot read and write yet. When characters will be introduced, students learn the

system behind the characters but will also learn how to type in pinyin on devices to be able to write in characters on the phone and the computer. This way, students need to be able to pick the right character corresponding to the pinyin equivalence.

Hutong School offers weekly tutorial sessions for students where the students can receive feedback on their learning procedure. How many students make use of this offer on average?

These sessions are more offered out of marketing reasons and are often used as a sales argument, as these classes are free on top of the program. These sessions are explicitly for talking and are for those students who really want to do more progress.

The customer satisfaction survey showed that students rated the comprehensiveness of classes quite low. This means there would be potential to increase the comprehensiveness which means the order of how topics are taught. On the other hand, do you think students also wish to have flexibility because there are things they would like to learn first?

Usually teachers are expected to follow the given structure. Some improvisations and variations are accepted as long as they are topic/field related. However, even if students express wishes, the teacher should follow the Hutong School program. Otherwise, students may need to learn too many complex lessons at once and may become confused.

Intensive Chinese students have 20 hours per week (4 hours daily). How many hours of self-study are recommended for a student to be able to follow the class progress?

For a quick progress, another 1.5 hours daily reviewing the recently learned topics and finishing the homework is recommended. Homework assignments usually consist of 3 options. In beginner classes, students are expected to write simple sentences with the recently learned structure and vocabulary. After some progress, students are expected to write small or medium length essays with given vocabulary and grammar structure help. After about 3 months, students should be able to write essays or stories completely free.

8.1.2   Interview with teacher 1
Do you think an app can support learning characters (writing, reading and recognizing)?

Yes. An app would be highly useful, especially with modules like animations (to show stroke orders), recordings or games like matching characters with pictures, putting characters in orders to form a sentence (similar to what's in Duolingo). To learn characters, it's also important to give examples so that the students know how to use the characters properly. Moreover, the examples should be organized according to the students' level so that they wouldn't get confused by new characters in the examples.

Do you think an app can support learning Chinese conversation (written and oral)?

Yes. An app would be helpful if it has recordings of the conversation spoken by native speakers, or if it can record and replay the conversation spoken by the student so that the teacher could correct the pronunciation.

Do you use any contents in your classes other than Hutong School book? This can be games, videos, images, objects etc.

Yes. I would also use images, videos, games (so far we only had games for number) etc.

Do you think interactive functions in class are necessary? This could be the possibility to quickly do some quizzes and assessments during class and collect students' answers through the app?

Yes, it would be helpful to test and reinforce what the students have learnt in the class. Also, to give quizzes or assessments, it's easier to do on the phone because the students have less problems typing Chinese than hand writing Chinese.

Do your students make always more or less same progress or do you have students who learn faster whereas others need more time?

It is difficult to keep the whole class at the same level because some work harder in/after class while others might make less efforts.

Do students ask you for feedback about their progress? If yes, what do you answer?

Not really.

8.1.3   Interview with teacher 2

Do you think an app can support learning characters (writing, reading and recognizing)?

Yes. An app can be used for many parts of learning Chinese. I would say anything except pronunciation. For pronunciation, students need the teacher to listen to first and also the teacher can correct the students' pronunciation.

Do you think an app can support learning Chinese conversation (written and oral)?

It could work. For now, I use WeChat with my students. I ask them to speak the new words on their phone and send me as a voice message and I will correct them.

Do you use any contents in your classes other than Hutong School book? This can be games, videos, images, objects etc.

Yes. I use Podcasts containing dialogues which we use in the classes, mostly for beginner students. I also use flashcards containing the simplified character on the one side and the pinyin transcript and an association on the other side. This helps to better remember the characters when the students can make up a small story with it. I also use AnkieApp, this app contains all the HSK vocabulary, this is especially helpful when students plan to do an HSK test.

Do you think interactive functions in class are necessary? This could be the possibility to quickly do some quizzes and assessments during class and collect students' answers through the app?

Again, I use WeChat in my classes. I ask students to type either vocabulary or from more advanced students I expect to type some texts and essays. Or I send them questions like in a small talk chat and they need to answer and also ask me back some questions.

Do your students make always more or less same progress or do you have students who learn faster whereas others need more time?

My students call me very strict because I expect a lot and I test them every day. They know, that if they do not remember at least 90% – 95%, we will not continue with new items.

Do students ask you for feedback about their progress? If yes, what do you answer?

They get feedback nearly every day since we have tests every day, so I would say they feel quite challenged.

8.1.4   Interview with teacher 3
Do you think an app can support learning characters (writing, reading and recognizing)?

Yes. For example after class when they go out and explore Shanghai, students can revise much better because they have the phone always with them. I recommended my students the App ChineseSkill, it is free and it has some functions like the stroke order. It shows in which order and direction the strokes need to be painted.

Do you think an app can support learning Chinese conversation (written and oral)?

I think for languages, it is important to talk and I think it is better to talk with real people than talking to an app. The students here are in China so it is best for them to just go out and use the language.

Do you use any contents in your classes other than Hutong School book? This can be games, videos, images, objects etc.

Yes I use flashcards to learn characters, or I also use a city map of Shanghai when we learn directions in class. I have also used already a memory card game which is specialized to learn characters because you have to find pairs that form a new character or a meaning.

Do you think interactive functions in class are necessary? This could be the possibility to quickly do some quizzes and assessments during class and collect students' answers through the app?

I am not sure, it always depends on the students. Some students do not spend much more time after the class on learning Chinese so they might not make use of it. Many students here want to explore the city and enjoy life in China.

Do your students make always more or less same progress or do you have students who learn faster whereas others need more time?

Yes. For example, internship students are sometimes not that much interested in learning Chinese. They have their work and also want to have some free-time. The progress in internship classes is often mixed because some want to enjoy, but some also are really motivated and want to be on a high level. In this case maybe, it would be helpful to think about switching classes.

Do students ask you for feedback about their progress? If yes, what do you answer?

Often the more advanced and high level students asked for feedback and want to know what they can do more. I often tell them to revise and use some Apps, some more advanced students can start to watch Chinese TV or listen to Chinese songs. It is important to be connected to the language as much as possible.

8.1.5   Electronic interview with Skritter
Do you already cooperate with language schools in a way that your app is used as primary/core material?

A good number of different schools use Skritter in their curriculum, however how much emphasis is put on Skritter versus other material isn't something that we immediately know. In some cases it

might be more of a main focus, however it's likely that it's used a supplement or form of homework, reviewing words and characters that had been taught in class. Most official lists on Skritter are textbook lists and it's a good assumption a classroom is using a specific textbook, whether a popular published one or an in-house textbook. All writing practice and memorization could be done in Skritter and gices a cutting edge on how quickly you can learn things and how long you can retain them, but I do suspect there would need to be more structure than that to a classroom.

You promise that students will remember 95% of what they have learned. How can you assure that?

The "remember 95% of what you learn" figure is based on throwing down hard statistics on how quickly you can learn a word or character, those are the numbers we get when we average it all out based on the site. (The 95% is to try and communicate the efficacy of spaced repetition).

In order to reach the 95% goal, what do the students need to do in terms of studyload and repetition etc.?

To reach this goal, you would need to ensure that the "items due" queue is cleared on a daily basis. As long as items are studied when they are 100% due (and not 110% due, meaning it's overdue and too much time passed until reviewing it), the retention rate should be around 95%. How many new words are added and how many reviews are generated are of course dependent on your retention rate and items due number.

One of the advantages of an app is the opportunity to use it nearly everywhere like when waiting in a line, commuting on public transport etc. compared to when learning with a study book (due to its heavy weight and size, it is usually inconvenient to carry around). Do you think/know if there are topics that should be learned in a quit, non-distracting environment while other topics can more easily learned in frequent, short intervals?

Location is actually an interesting topic when it comes to learning-- generally when you're in a unique enviroment, you have a much better chance of remembering something that you had learned there, (versus the same setting you're always in). I don't know much about topics that "should" be learned in a quiet setting versus distracting one, I've never really considered this concept! If I had to pick a side, I would say the more distracting (except to the point of being unable to concentrate), the better. I'm not sure if that's a helpful answer though!

8.2   Further survey results

8.2.1   Preferences for interactive features

label	not needed	I could live without	maybe	quite important	absolutely required	weighted average
numeric value	0	1	2	3	4	
percentage	9.52%	14.29%	28.57%	33.33%	14.29%	2.29

Table 4: Preferences by students for interactive features in percentage

8.2.2 Language preferences for a dictionary
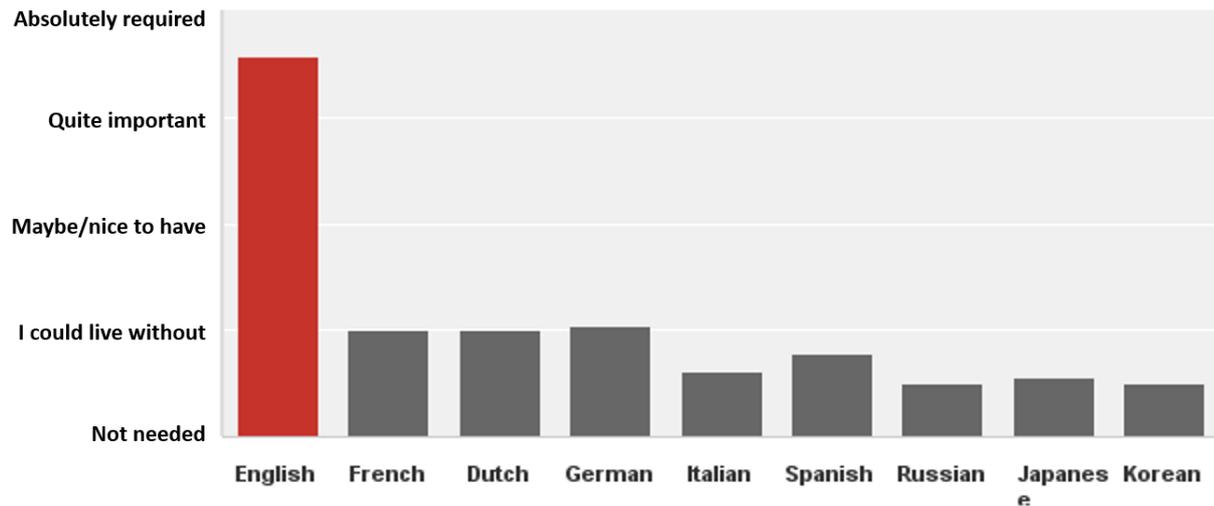
Image 12: Preferences by students for dictionary translation languages

8.2.3 Open answer comment box

These are the responses students could give in a comment box in the end of the survey

Great idea!
5/18/2016 12:13 PM

Implement a collaborative flash cards system / Have access to Chinese TV series / Build a platform allowing to connect with native Chinese speakers
5/10/2016 1:51 PM

Pin yin info, grammatical rules and tone info.
5/10/2016 11:44 AM

How soon?
5/10/2016 11:34 AM

8.3   Survey design

Attached is the complete online survey. It has been exported from surveymonkey. The resolutions have been modified by Microsoft Word to fit A4 pages. Apart from that, no changes have been made.

Your opinion

Please indicate your opinion about a smartphone and tablet app by answering the following questions. Your opinion will influence the app development as we want to design this app to suit our students' learning preferences.

1. How likely would you use a smartphone or tablet app to study the following course contents?

	never	rarely	maybe sometimes	quite often	I would love it
Vocabulary learning	○	○	○	○	○
Pronunciation practice	○	○	○	○	○
Calligraphy practice	○	○	○	○	○
Conversation practice	○	○	○	○	○
Grammar learning	○	○	○	○	○

2. How intensively would you use additional features of the app outside classes?

Additional features would be quizzes, games and more contents you could use to further immerse with the language on a voluntary basis.

	never	rarely	maybe sometimes	quite often	I would love it
Quizzes (to repeat the learned content and to check your progress)	○	○	○	○	○
Games	○	○	○	○	○
Audio and Video content (like Chinese songs and Chinese video clips like News or cartoons)	○	○	○	○	○
HSK exam training	○	○	○	○	○

3. Would you follow online courses with an app?

Please indicate whether you would make use of the service by ticking either yes or no.

	never / very unlikely	unlikely	maybe	likely	for sure / very likely
Online courses in advance to your China immersion	○	○	○	◉	◉
Online courses in addition to your Chinese classes	○	○	○	○	○
Online courses replacing 50% of your Chinese classes	○	○	○	○	○

4. **Do you wish to have interactive features?**

With such a feature, a teacher could easily do some quick assessments to see your progress. Students would be asked quick questions and tick the right response on your smartphone.

not needed	I could live without	maybe / nice to have	quite important	absolutely required
○	○	○	○	○

5. **Please indicate how likely you wish the app to contain a dictionary.**

not needed	I could live without	maybe / nice to have	quite important	absolutely required
○	○	○	○	○

6. **Please indicate the importance of languages the dictionary should support translations to and from Chinese.**

Skip this question if you would not wish to have a dictionary integrated in the future app.

	not needed	I could live without	maybe/nice to have	quite important	absolutely required
English	○	○	○	○	○
French	○	○	○	○	○
Dutch	○	○	○	○	○
German	○	○	○	○	○
Italian	○	○	○	○	○
Spanish	○	○	○	○	○
Russian	○	○	○	○	○
Japanese	○	○	○	○	○
Korean	○	○	○	○	○

7. **Would you like to receive feedback on your learning progress digitally (compared to the weekly feedback sessions)?**

○ Yes, in addition to the weekly tutorial sessions

○ Yes, instead of the weekly tutorial sessions

○ No, I prefer having weekly tutorial sessions only

○ I am not interested in feedback

8. **Is there any other aspect about this topic you would like to add?**

If yes, please give your comment here.

[   ]

Your data

In order to assess and correlate your opinion to better represent all our students, we need some personal data. Don't worry all data is kept confidential and will be processed in a way that individual answers are not traceable.

9. Which program are you currently following?

- ○ Intensive Chinese Program
- ○ Internship Program
- ○ Volunteer Program
- ○ other (please specify)

10. How long is your program with Hutong School running?

- ○ up to 1 month or less
- ○ up to 2 months
- ○ up to 3 months
- ○ up to 4 months
- ○ up to 5 months
- ○ up to 6 months
- ○ more than 6 months

11. Please indicate your age.

Please type in numerical characters only.

[ ]

12. Please indicate your level of Chinese before your arrival at Hutong School.

- ○ no previous knowledge
- ○ Beginner (equivalent to HSK 1)
- ○ Advanced beginner (equivalent to HSK 2)
- ○ Intermediate (equivalent to HSK 3)
- ○ Advanced intermediate (equivalent to HSK 4)
- ○ Proficient (equivalent to HSK 5)
- ○ Fluent (equivalent to HSK 6)

13. Please indicate the operational system your smartphone and/or tablet is running on

☐ Apple iOS

☐ Android

☐ Android based (like MIUI or ColorOS)

☐ Microsoft Windows

☐ Blackberry

☐ Other (please specify)

> [   ]

14. Please indicate your profession.

○ Student

○ Employee

○ Management position

○ Self-employed

○ Retiree

○ Non-working

○ Other (please specify)

> [   ]

15. Please indicate your native language(s) and languages you speak at least at an intermediate level (equivalent to HSK 3 or B1)

If you do not have enough qualified proficiency of a language in the list, you can leave the row blank.

	intermediate	proficient	fluent	native
Arabic	○	○	○	○
Bulgarian	○	○	○	○
Chinese	○	○	○	○
Croatian	○	○	○	○
Czech	○	○	○	○
Danish	○	○	○	○
Dutch	○	○	○	○
English	○	○	○	○
Estonia	○	○	○	○
Filipino	○	○	○	○

the list continues on the following page

	intermediate	proficient	fluent	native
Finnish	○	○	○	○
French	○	○	○	○
German	○	○	○	○
Hungarian	○	○	○	○
Indonesian	○	○	○	○
Italian	○	○	○	○
Japanese	○	○	○	○
Korean	○	○	○	○
Malaysian	○	○	○	○
Nepali	○	○	○	○
Norwegian	○	○	○	○
Romanian	○	○	○	○
Russian	○	○	○	○
Spanish	○	○	○	○
Swedish	○	○	○	○
Thai	○	○	○	○
Turkish	○	○	○	○
Ukrainian	○	○	○	○

Other (please specify)

16. **How many weekly hours of language classes do you have?**

Please type in the amount of scheduled hours your program included e.g. 4 hours if you follow the Internship Program or

20 hours if you follow the Intensive Chinese Program. Please type in numerical characters only.

Thank you very much!

Your results have been saved! Thank you very much for your contribution to this project. This will help us a lot in the development process of a future Hutong School language learning app.