

Generative Research Report

INTRODUCTION

The *Word by Word* team's generative and exploratory research was focused around three research questions posed to better establish ourselves as a competitor within our market and develop a valuable and informative product. The first question posed how *Word by Word* would most effectively convey the objectives and value that our system delivers to our users through our value proposition. Second, we posed how our team would best compose the questions that make up the interactive portion of our system that would best afford vocabulary learning and retention. Finally, we performed a competitive usability test on two of our system's direct and indirect competitors within the market to determine how *Word by Word* would best be able to differentiate ourselves from our pre-existing competition.

PROBLEMS

Value Proposition and Branding

One of the issues our team has experienced within the development of our project is how best to word our system's value proposition to convey the overall objectives of *Word by Word* and the value it can bring our users. Within our preliminary prototype testing, we encountered confusion from various test takers as to what exactly our system was supposed to help them achieve. How could we succinctly describe *Word by Word* without confusing our audience? What is the best way for us to describe *Word by Word* to convey its value to our audience?

Question Composition

Another one of the primary issues run into by the team members was of composing the questions in a format which would best afford learning, recalling, and retaining vocabulary for prospective users in a way that is most beneficial for them. The team members were unsure of how best to maintain this aspect of consumer satisfaction and to increase consumers' intent to purchase the product. What will compel someone to purchase a product if they do not know how it is going to directly benefit them?

Competitor Usability

Because of the common practice of foreign language learning systems, the team members ran into the problem of differentiating *Word by Word* from what could be competition. What makes these programs stand out as being direct competitors, and what drives users to use them when wanting to learn new vocabulary? The team members were unsure about which elements from these programs captured the learners' attention, assisted in their understanding of the individual words, and afforded learning of these words.

METHODS

Value Proposition and Branding

With this test, we aimed to determine how best we could describe our system to our users through our value proposition. We determined that the best way to accomplish this task was to utilize a survey that was distributed randomly to individuals who had no prior knowledge of the *Word by Word* project. The survey began with providing the survey-taker with three potential value propositions and prompted them to read through each and write a brief description of what they assumed the system was meant to do based on their first impression. The aim of this first section was to see which, if any, of our proposed value propositions could properly convey our system's objectives. Following this, the survey-taker was then provided a more thorough description of *Word by Word* for them to read over. Once read, they were to re-examine the three potential value propositions and record on a Likert Scale how effective or ineffective each respective proposition was at representing the system as it was described to them. Finally, given the description once more, survey-takers were prompted to rank each of the three potential value propositions in the order of the most representative to the least representative. These two latter sections of the survey were added to determine what our potential audience members considered to be the best way to describe our system.

Question Composition

The team determined that for coming up with the best type of question composition for vocabulary learning practices, the methods of research and of examination of prior interviews with language professors would be the most appropriate and effective. For the research aspect, team members examined multiple published studies on the topic of vocabulary learning retention as well as individual analyses of the subject. Their end goal was to find a method that the *Word by Word* system could be based off when creating questions for users. One which would work best would be to find how knowledge is retained in social and cultural settings in relation to vocabulary learning as well as being able to test this knowledge.

The team had spoken with multiple language professors in the months prior to this research report about their current methods of teaching vocabulary and whether they deemed these practices to be effective for their students. Team members had asked the following to these professors as demonstrated in the test plan written prior to this report: what methods are currently used to teach vocabulary to their students, what measures are taken to ensure that this vocabulary will be retained, what information is most important for the program to highlight in the questions given to the learner, and whether the professor would purchase the system after knowing potential benefits it can offer learners.

Competitor Usability

After doing some research on who the top competitors would be for *Word by Word* in terms of foreign language learning, the team chose to examine the practices done by Duolingo and Quizlet to see how they stand out as being direct competitors. Duolingo is a free service with an optional paid subscription model. They claim to be "the world's best way to learn a language" as, citing simply "science" as their baseline for why this is true. Quizlet, on the other hand, is not primarily a foreign language learning system but rather "makes simple learning tools that let you study anything," mostly using flashcards as the first step for learning something new.

In order to analyze how Duolingo and Quizlet utilize their resources as ways of implementing vocabulary learning practices, the team members used the research method of testing and follow-

up interviews with five language learners to determine what elements most catch their attention, which ones are most helpful and least helpful, and which ones are most likely to stick with the learners. The team members will use this data when constructing their own system of *Word by Word*, taking into account what kinds of elements may be best to implement versus ones that make not work as well for retention of vocabulary.

RESULTS AND ANALYSIS

Value Proposition and Branding

Results. Respondents were given three value propositions and asked for their initial opinions and assessed their answers on whether they hit the main three pillars of our value proposition: individualized, multimodal, foreign language vocabulary learning. The first value proposition gathered the most correct definitions of the system based purely on the value proposition, with most respondents highlighting at least one to two of *Word by Words*' three identifiers. However, while they were able to identify the purpose of *Word by Word*, they proposed the system taught more than just vocabulary. The second proposition also fared quite well in describing the purpose of *Word by Word*, hitting the one to two the three main pillars of *Word by Word*. They seemed to grasp the individual learning aspect but lacked the value parts of the system. The third value proposition was the farthest from the system definition and value, only offering very direct and vague answers to the system design.

The second aspect of the survey asked respondents to measure how well the value proposition represented the given explanation of *Word by Word*. Scored from not well at all to extremely well, value proposition one stood out with the most positive feedback. All respondents marked the value proposition from very well to extremely well. The second value proposition had half of respondents respond with slightly well and the remaining split evenly between moderately to extremely well, while the third value proposition did not resonate well with the description of *Word by Word*. The third proposition saw the only responses of now well at all with 25 percent of respondents choosing that option. The highest praise it received was one vote for very well, with all other respondents in the middle between moderately well and slightly well.

The last section asked respondents to compare the three statements to each other to show which better represents *Word by Word*. Value proposition number one received the most placements as the most representative, with 50 percent of respondents placing it first and the remaining 50 percent placing it second. Value proposition two placed as the most representative by 37.5 percent of respondents and second by the same percentage. Value proposition three was placed as least representative by 75 percent of respondents.

Analysis. The value proposition survey saw value proposition one stand out as the most representative of the *Word by Word* system, with nearly all section placing it with the best results. With most respondents being able to somewhat define *Word by Word* purely from reading the value proposition. The second section showed it represented the system well, when users understood the system, and the last section ranked it the most favored and representative between the three options.

While the second value proposition did not stand out as much as the first value proposition did from an aggregate perspective, it did have some valuable feedback. The value proposition was ranked higher than the first value proposition by 35.7 percent of respondents. From the initial responses from users who have never heard of *Word by Word*, they were able identify the system

as a vocabulary system, but unable to move beyond the concept. One even noted it sounded like a “online dictionary.”

Value proposition three stood out as the least with its ability to convey the purpose and value of the *Word by Word* system. Participants, upon first introduction to the statement, compared *Word by Word* to Google Translate, saying “This seems like it could be similar to google translate where you do not really learn the vocabulary, you just put one language down and it automatically changes it for you.” The value proposition also received the lowest ratings in representing the *Word by Word* system when compared to the summary and to other value propositions.

Question Composition

Results. After extensive research into best vocabulary learning methods for creating question composition, the team members narrowed the results down to three learning practices that could potentially be effective for the *Word by Word* system to implement. These methods are known as the competency-based learning model, the socio-psycholinguistic theory, and the schema theory. While all of these could essentially work together to create the most effective learning model for crafting vocabulary questions, the one which is most relevant for the *Word by Word* system is the competency-based learning model. Analysis of these models and how they can work or not work for the system will be listed in the next section.

Upon examining the interviews conducted with language professors from several months prior, it was made relatively clear to the team just how effective some new vocabulary learning methods would be, but at the same time, the value proposition would need to be articulated well in order for the professors to consider purchasing the system for their students. Most professors cited Quizlet as their primary method of teaching vocabulary as a common frame of reference that students use for vocabulary recollection and stated that the competition aspect of this program is what drives students to learn. The competitive usability section of this report will delve into whether this appears to be accurate for language learners.

One professor cited the idea that learners learn and remember when they engage in meaningful interaction. Vocabulary that is useful for these learners such as needing to use the restroom or wanting to make friends is going to stick with them much more than the simple need to pass a quiz. This is the most appropriate measure to ensure that vocabulary will be retained even after a period of time, making sure that vocabulary is taught in context.

The question regarding what information is most important to highlight in the questions given to the learner had mixed answers from the professors. One professor cited their current use of flashcard apps or keeping a notebook for reference and that this tends to help students with keeping up with real-world contexts, though they also stated the importance of not just having literal translation into English of individual words since they have found that this does not typically promote optimal retention or functionality with new vocabulary. Most professors would consider purchasing the system after knowing potential benefits it can offer users, as long as the price remained affordable and the service was liked by the students.

Analysis. Research into vocabulary learning practices best suggests that the competency-based learning model is the best method for *Word by Word* to implement when creating questions based on vocabulary retention. This is the vocabulary learning method the team is looking to base off for the *Word by Word* system due to the demonstration of knowledge being tested and the reinforcement of positive learning techniques. Questions created for the questioning algorithm

function of the system will allow for individual learners to display where they are at in retaining vocabulary, and professors will have the ability to view this process.

The socio-psycholinguistic theory works in the respect that it looks at how knowledge is retained through social and cultural settings, similarly to how the team wants the questioning algorithm to come into play, but it fails to consider how students will be tested on the material at hand. The schema theory would work for how *Word by Word's* word pages will be organized into the units that this learning practice mentions, but this practice is virtually irrelevant when considering how questions need to be organized to best fit learning and retaining vocabulary for learners.

Based on the data given from the interviews with the professors, the team looks at the competency-based learning model as the learning method that will satisfy these professors as well as the learners of the language. This model is based on how individual learners demonstrate that they have learned the knowledge and skills they are expected to learn in a time period. Because of the variety of questions that will be given and by giving professors the ability to view how their students are learning the material, this will not only allow learners to engage in meaningful interactions with cultural and social contexts but also not only have the direct translations which worried professors initially.

Competitor Usability

Results. Individual participants for the competitor usability tests were asked a screener question of whether they were currently studying a foreign language or wished to do so, and if the answer was yes, they would proceed to testing of *Word by Word's* competitors. The participants were first asked to go onto a provided introductory lesson of Duolingo and complete this lesson to the best of their ability. The participants proceeded to regard these introductory lessons as entirely too easy, mostly citing that since it is introductory, it should be simple, but it also felt a bit like handholding and that all of the answers were just given to the user.

One participant decided to take a lesson that was much further down the page of lessons to see if the content increased greatly in difficulty. They found that it was indeed slightly harder since they had to construct sentences by typing and use some different methods of learning rather than just picking and choosing from provided words. However, this participant still felt as though they were not truly retaining any of the information, and, similarly to the other participants, they did not think they were truly learning any of the material.

After completing the portion of the test with Duolingo, participants were asked to take a provided introductory lesson from Quizlet and complete this lesson to the best of their ability. What was immediately noticed by almost all the participants was that answers were wrong on the flashcards, making them immediately question the credibility of the user who had made this flashcard set. A couple of them had also decided to skip the flashcard portion and play a game instead since they already had some knowledge of Spanish, but because some of the words were associated only with an image, the participants now had no idea what image was supposed to be with the respective words, causing confusion and expressed irritability.

Analysis. For Duolingo, any elements that caught participants' attention typically had to do with the flat design, the animation, and the images that were used. What was found to be most helpful was the repetition (though this was also cited as a factor for not needing to pay attention) and that the color choices were good when saying when the participant was right or wrong. What was found to be least helpful was the program giving out the answers and not making the user think comprehensively. Overall, participants were not impressed with what Duolingo had to offer.

For Quizlet, the structure was found to not be easy to navigate for a new user; participants who had expressed not having used Quizlet before were confused on where to go first with the lesson. Most stated that there was too much information to digest at one time, and it also did not help that the creator of these flashcards had wrong answers in their set.

There were not as many elements that caught participants' attention the way Duolingo had. However, in terms of what was most helpful, one participant appreciated the slow progression of difficulty through the flashcards. Another pointed out that with the quizzing function, the algorithm did not get rid of the question until the user would get it right multiple times, which this participant found to be very helpful when retaining vocabulary.

Participants unanimously said that Quizlet was the better system of the two when it came to vocabulary learning retention since it does not just make the user simply memorize information but will have them work with it in different ways from the beginning. One participant also said it felt more age-appropriate than with Duolingo but that there was still too much information given at once.

RECOMMENDATIONS

Value Proposition and Branding

Based on the survey, value proposition one stood out as the clear front runner, mostly due to its encompassing definition and presented benefits. The statement was able to give the respondents a basic understanding of the system as well as convey some value. It also maintained its position when given background knowledge of the system, even reinforcing its value. While proposition two did not stand out as the frontrunner, it did have some positive aspects that kept it in near second place. This value proposition was better able to grasp the application aspect that *Word by Word* looks to offer its users. While value proposition three scored the lowest on all aspects of the survey, it did capture some *Word by Word's* different approach to vocabulary learning.

From these results, it would be recommended to choose value proposition one, as it fared the best in the survey and received the most positive feedback. This value proposition captured attention and conveyed an understanding to our respondents, which is integral to a strong value proposition. However, it is still recommended to improve the statement and look to strengthen it based on the results of the other statements. The first statement was designed as a more definition-based statement and it resonated well with respondents, while the third one, which was solely value based, did not. Given the importance of conveying value, the first statement must be slightly reworded to resonate more value with potential users.

Question Composition

Moving forward with question composition, the team will further examine the competency-based learning model and apply this method to all the ways of learning offered to the language learners using *Word by Word*. Questions created for the questioning algorithm will need to take this learning model into account to ensure that learners are retaining the vocabulary and applying it to real-world contexts.

These questions should also afford retention and remain sticky in the users' mind. Part of retaining vocabulary is the ability to reinforce learning through all aspects of the system. While the questions are not the only aspect of the system, each question must be able to not only examine competency but also afford a deeper understanding of the word. The competency-based

questions should also be variable, using different questioning methods and structures in order to ensure challenging and engaging comprehensive learning.

Competitive Usability

After running tests of Duolingo and Quizlet's programs, there are aspects of both that could be implemented in *Word by Word's* system when it starts to officially be developed while there are also ones that the team should avoid based on feedback from the participants. The team should avoid having a lack of variety in the types of questions given, and they will need to keep in mind that different methods of learning work for different types of users. Having different types of questions asked to the user avoids the monotony of automatically knowing the answer and not truly having to think or retain the information given.

Keeping this aspect in mind, having images, audio, and an overall more visual and aesthetically pleasing approach will resonate more with users than having everything strictly text based. The design of the initial visual interface should not be overwhelming for a new user to navigate; they should be able to figure out what to do at the start of opening the system for the first time. Despite the vocabulary words in *Word by Word's* program being relatively simple in terms of comprehension, the team will also need to ensure that the program does not feel juvenile as this will be off-putting to potential users.