A Comparison of a Self Paced Education Styles:

Video and Reading

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Introduction

There are many factors that interrupt a high school student's ability to learn in a traditional classroom setting. From time constraints to mere disinterest, implementing more effective methods of learning has been sought upon. To some extent, people can still be successful with how education works now. Self-paced education was made for removing time constraints. With all types of education, one can optimize its effectiveness and in order to do so, a comparison of the two most common methods of self-paced education was made. Specifically, one where emphasis is put on video learning and one where emphasis is put on reading online texts and webpages. Both of these methods were tested based on an introductory unit to the Welsh language. Test scores and overall student confidence is assessed for each group at the end of the unit.

But to understand how these two groups compare, the basis of the self-paced education process must be outlined. Self-paced education, as the name suggests, is a type of learning where students learn at their own pace rather than than the pace a teacher sets. The main example of this self-paced education process is discussed in *Another View of Self Pacing* by James Klausen. Klausen is a science teacher who decided to teach a simple-machines unit with this method. In order to help guide this unit, "Students received a flow chart at the beginning of the unit that indicated core, remedial, and enrichment labs," (Klausen, 1973 p.3). This effectively gave the students a map of what material they should do in what order. Along with this map, students never heard a lecture from the teacher as Klausen gave the students resources to do these "core

and remedial labs" which is what the unit was based off of (Klausen,1973 p.5). By giving the

students the map and resources to success, self-paced education can generate more interest

through its independent nature.

Along with generating interest among students, self-paced education can be implemented

in many different ways. For example, work done by Douglas N. Lacey, a professor at Ohio State

University, and case studies done by South African University describe how book and video

learning respectively are effective. Lacey taught a self-paced Latin course where students in class

"[Used]their textbooks to address the formation of nouns, adjectives, verbs, as well as

vocabulary" of Latin to go through the course (Lacey, 1981 p.5). South African University used

podcasts as a way of "mobile learning" where students absorb information on the move and have

increased knowledge of the subject (Ng'ambi & Lombe, 2015 p.8). Specifically, Lacey saw how

"students are moving through the self-paced course more steadily" than regular Latin classes as

students are more comfortable with the way the units work. Likewise, professors at South

African University noticed that through the variety of settings you can listen to podcasts that

students have been "using [podcasts] as an aid to memory and reflection." providing a way to

bridge the gap between learning at home and school (Ng'ambi & Lombe, 2015 p.9). These

results are promising in that students have more places to learn through videos and podcasts and

that books provide a steady rate of learning. Whether this is a common trait in both types of

research will be examined.

Literature Review

Self-Paced Education: Language

You can implement self-paced education to a variety of subjects. One of these is the implementation of foreign languages, much like the self-paced Latin course. Although no research has been done on self-paced learning for the Welsh language, it has been done on other languages. These courses have the same core structure. For example, in a self-paced college level Spanish class an experiment was done where students went through an objective list where students took a test when they, "felt [they were] ready and needed a score of at least an 85 to go on to the next unit"(Hartley and Dannerbeck, 1974 p.4). This mirrors the flow chart of the Latin course because this guidance is easy to implement. It also makes sure the student is ready for the next unit by requiring a high minimum score. None of the students had any experience with learning the Spanish Language. A control group was made where some students learned Spanish in a traditional classroom fashion where pacing was decided by the teacher and any score was accepted to go onto the next unit. The experiment found out that the self pacing group was able to learn "as fast or even faster than the control group" depending on their background in foreign language (Hartley and Dannerbeck, 1974 p.7). This pace indicates that students then would learn at a faster rate, making it preferable.

Along with Spanish and Latin, the French language has also used a self-paced format. Florida State University implemented this self-paced French course where students went through each of the four elements of language which were "writing, reading, culture, and

speaking,"(Leblanc 1992 p.3). Doing this makes it so one is proficient in one aspect rather than mediocre at all. This element of mastery, whether it be by focusing on one topic or getting a high grade in a unit shows up again and again to make sure students truly know their work. Along with that, the teacher still has a role in the classroom as they serve as the main guide to the students. For example, they can offer "small tutoring sessions" when needed (Leblanc, 1992 p.4). These tutoring sessions were put into place so students were not left behind and because of this, "students in the individual program received a higher percentage of superior grades than did the students in regular classes"(Leblanc, 1992 p.5). The results of Latin, French, and Spanish self-paced courses correlate with each other in that this type of instruction is effective in ensuring good test scores and overall knowledge of the topic when compared to how education is done today.

Online Communication in Self-Paced Courses

There is another type of self-paced learning which is done through the implementation of working on the computer. Although this experiment will be all in person or face-to-face, it is still worth noting how such online schooling positively affects students of all backgrounds. The *Quarterly Review of Distance Education*, a journal that publishes articles focusing on distance education, had a study to help close the gap in pacing between kids who have mental disabilities and those who don't. It employs a set of strategies that help target these students such as "brisk pacing" which means it is more concise(Allday, 2011 p.2). This is all done in a virtual high school. Such a school is made to implement these pacing methods so they can accommodate the various learning styles that each student has with minimum work needed by the teacher. The results of this course indicate that both disabled and non disabled kids picked "similar pacing

requests" so they learned at about the same rate(Allday, 2011 p.3). Along with this, the requests were upheld in that no student dropped down a level in pacing. Such a similarity gained by this research proves that self-paced learning can close this gap of success between disabled and non disabled students. Although, it also asks the question that follow-up studies should collect specific-disability data and to compare the outcomes of students in virtual and traditional high schools. This study does not have enough time to accommodate for disabled groups, but it could be a source of future research.

Along with helping disabled students, self-paced online learning improves teacher confidence as well. The *Journal of Asynchronous Learning Networks,* a scholarly journal that focuses on types of learning like self-paced, compared the effects of online and face-to face communication in a mathematics development course. There were two different courses, an online version that used a website to deliver course material and a face-to-face version where students attended weekly class sessions. Through the use of surveys and assessments, the study found that "A majority, 92%, of teachers filled in that they were 'more confident' at the end of the both courses,"(Russel, Carey, Kleiman, & Venable, 2009 p.5). Such confidence brings the idea of teacher feasibility to light as teachers will get used to self-paced education just like they do with traditional classroom learning. The drawback is that self-paced education requires an excessive amount of time. So, even if teachers are still finding success in both their disabled and non-disabled students, they still have to plan out the full curriculum beforehand. Such work was not done by the teachers in this study. Virtual high schools has its benefits in self-paced education once the initial technological hurdle has been dealt with.

Multimedia Uses

Along with full on virtual high schools, more feasible options exist in the form of video and audio tools. These are available to all teachers and is the main motivation for the video learning portion of this experiment, as they combine audio and video so a student can absorb knowledge in different ways. Along with podcasts as mentioned in the introduction, videos from Youtube and 3D tutors can be incorporated as well. In an issue of *Science and Children,* a professional journal for science teachers published by the National Science Teachers Association, J. Everhart describes how he "energized [his] teaching and helped motivate students" from youtube videos(Everhart, 2009 p.6). Although the idea is not new, the results and layout of his work are promising. He found out what students already knew through the use of a pretest and then arranged a group of videos for students to view on his website. Along with that, he also encouraged the teacher to create their own videos as he found out that students showed "greater understanding"(Everhart, 2009 p.7). This is not surprising as by using the results from the pretest, the teacher can address all the key aspects they would want their students to learn. Although Everhart is just one teacher, his ideas form a key framework for the methodology of the video learning. Again, the experiment here has video learning tested so this source serves as a guide.

Much like videos, one can make programs for 3D tutors to teach students. A 3D tutor is a program for students where they can scroll around a virtual playspace. The *European Scientific Journal*, a peer reviewed open access journal that collects research articles, highlights this when they tried this out. The limitations of this process came apparent when traditional motion

capturing would not work due to "safety reasons and body parts blocking key segments,"(Zysk & Filkov, 2013 p.4). Also, since the average teacher would not have such motion capturing technology available, the process had to be made all on the computer. Instead, they used a 2D stickman sketch and made a recreation of the human body to match those movements. Despite this, results were promising as the test audience indicated how the program was "user-friendly and informative" although they were a bit distracted by the concept of a virtual tutor (Zysk & Filkov, 2013 p.5). Due to the difficulty of making one 3d tutor, a more centralized system of tools would be needed. This means that teachers can go to one space and download virtual tutors that are available to the subject they teach. The lack of such a system does not halt technological learning as video learning is still feasible and produces positive results.

Withdrawal from Self-Paced Education

Learning styles can always improve and one major issue of self-paced is that some students leave. There are certain measures to prevent this however. The *Journal of Public Affairs,* a journal aimed to increase diversity in learning styles like self-paced, hypothesized that "role overload" is what causes people to drop out(Carnevale, Mareschal, & Rudin, 2000 p.4). They targeted being married, female (due to home obligations), or having a full time job were the causes for leaving the College of Liberal Studies. Surveys were given out to people who had dropped out from the self-paced art history course at the College of Liberal Studies. They found out that "time pressures" and "program processes" were main influences to why people dropped out, although gender, marital, and employment status did not matter as much(Carnevale et. al, 2000). Such time constraints can be seen if one delays work or if one realizes the course is too

rigorous. Although this was done in only one university, the study size of 638 students was large enough to establish this consensus.

Although the problem of dropping out can't be solved overnight, one could establish the positives of self-paced education along with preparing the students early on in order to prevent dropouts. A study by the University of North Carolina even went as far to using self-paced education to re-enroll people back into high school classes. Set in an alternative high school building, the main appeal was that students were using a tutor as their main source of learning. Although this can't be implemented everywhere, this method can be modified for use during the beginning of a course. Specifically, the study identified how the closeness to success or graduation from these tutors caused "seniors to drop out of this course the least" while the freshmen did the most. In order to combat students from dropping out, you need to show them that success is always near, which may not always be visible to freshmen. Thus, more time may need to be spent on with younger students.

Keeping Progression Up

Much like in traditional learning, the teacher needs to be able to monitor if the student is learning, if at all. Although a freedom of learning is the basis of self-paced education, progression should always go up and at maximum efficiency for the student. The *Journal of Memory and Language*, a scholarly journal aimed at cognitive processes, examined how students in a self-paced learning group learned vocabulary words. Vocabulary words are a main key of language, as each word has its use, so such a method can be applied and measured in learning Welsh vocabulary. They put students into two groups based on allocation of study time. One group would learn vocab words at a constant pace while the other would spend more time on

harder words. As expected, the group that studied the harder words longer was "more effective" as their time was more focused on what they needed to know and not forget(Tullis & Benjamin, 2011 p.4). Such allocation of time will be addressed in the interview portion of this experiment. The purpose of these interviews are to help monitor how students are learning and to see what other guidelines/strategies can be incorporated for future studies.

Allocation of time on a larger scale is also addressed and needed for self-paced learning. Classes are to still be finished in semesters so the main fear is that students will be caught up in time pressures if they procrastinate on their work. The American Mathematical Monthly, a journal that specializes in the field of this study, had a unique way of keeping progression up and monitoring students in a self-paced Physics+Calculus course. For monitoring, problems arose on what questions to give on the final exam as people would be in different spots so they only got questions on their "most recent topics,"(Protter, 1991 p. 10).

Being tested on their most recent topics does not mean a student could just study the last few chapters of a course and get an A for the semester. The course syllabus required them to progress through each chapter in order at a B minimum. For progression, the study used a "three-week rule" where you can only complete a certain amount of chapters before the final(Protter,1991 p. 11). This helps slow down students who would try to rush through the course as this rules affirms students that self-paced learning still needs time to work. This rule can also be used to plan ahead because if a student goes through the initial segments of the course at a certain pace, they can form their own goals on what chapter they should finish on for the final. Although the three-week rule can not be used in this experiment due to its short time

span, this type of ideology of getting students to progress is what is needed to fully benefit from self-paced education.

Methodology

The results of the test grades between book learning and video learning are to be compared directly. Interviews between students will be given to see how comfortable they are with this. This information will be reviewed to help improve Self-Paced Learning as a whole also. This is a mix of quantitative data and qualitative data used to support each other. Although this is only done in one trial, there are enough students and information to form a general consensus. The resources used can be found on the internet and are made from credible sources like the BBC website or native Welsh speakers.

Participants in this experiment are 9 students, 4 male and 5 female, aged between 15-17 of ABC High School. A short pilot program was done to make sure each website link works and to add in any sources if any of the links are broken. Students in the AP Research course were chosen because they are a group of students who are doing their own research projects. They know what to look for as they had to do the same for their own experiments. Some of them would later on be participants to this experiment. Participants had two main environments for learning: they could stay after school in the library from 2:30-3:30 or do the course as personal homework sessions. Food was offered as an incentive for the former method. I was in the room to help out with any Welsh questions for both groups but no in depth information was given. Participants who did the latter method promised to not study for more than an hour to ensure each student studies for about the same amount of time. No lectures would be given to the after

school group. Doing such would align the course too much to traditional classroom learning. Participants of this study had to sign a permission slip in order to get data collected from them but all their results were anonymous. Specific student examples are only referred to by a letter such as Student A.

Participants of this study were randomly assigned to either the reading group or the video group. The agreed upon presumption was that no one knew Welsh at the time so a pre test was not given out.

What each group learns from differs in that the video group would get YouTube videos and podcasts about the Welsh language while the book learning group would get internet articles and webpages. Since the sources did not match perfectly with each other, I had to make grammar videos based on the reading group's resources.

In order to not be biased in giving one group more preparation for the test, each source was checked and notes were provided on what information in the video or articles can be skipped.

The students were given the first two days or homework sessions to learn as much as they felt comfortable with of the Welsh Language. This was done in two small units of the Welsh language: the first being basic phrases and numbers, while the other will be focused on sports vocabulary and grammar.

The third day/session was to take the test on the Welsh language and get short interviews out of each student. The test was made out of the two units with each unit getting 13 questions. The unit one and unit two portion of the test were separated and evaluated as such. Along with this, no multiple choice answers were given so a student can not guess and skew the results. A

short analysis was used to identify the progression each group had gotten in the self paced

course. This effectively sees if one group got marginally better scores than the other. After the

test had been given, students were taken in for for a five question interview. The questions of the

interview were meant to gain feedback on how the course should run on a long term scale and if

the students felt engaged in their learning. Notes were be taken of what each student said in order

to gather a consensus for each question along with any profound statements.

Data

Table 1

Group	Unit One Average Score	Unit Two Average Score	Average # of Questions skipped or left blank	Best Unit 1+2 Score	Worst Unit 1+2 Score	Median Score for Unit 1+2
Video Group	33%	18%	3	31%	19%	27%
Reading Group	26%	8.6%	17.8	44.6%	0%	12%

No participant had opted out of the test. As seen on table 1, the Video Group had higher

average and median scores as opposed to the video group. There is a higher difference in Unit

Two where the difference in averages is 9.4% as opposed to 7% (+2.4%). Both groups received

lower averages from Unit One to Unit Two with a 1.8X decrease for the video group and a 3X

decrease for the Reading group. Despite the lower average and median scores, the Reading

Group had contained the highest combined score. Although not all the filled in answers were

correct, the Reading Group had skipped or left blank nearly 6x as many questions than the Video

Group. The Reading Group contained two students who had gotten no answers right.

During the interview, each participant had answered five questions. No participant had opted out of the interview. The first question was, "What is your opinion about the test you just took? Was it fair or unfair? What about it was fair or unfair?" According to respondents in both groups, the test was difficult yet fair as it was meant for beginners. Student B of the reading group had noted that "The questions were easy to understand."

The second question of the interview was, "What is your opinion about the way this self-paced unit was structured? Were the sources easy to follow? Did you go back to them?" Respondents from the Video Group noted that the videos were easy to follow. However, the Grammar videos which I made needed to have more in depth information and visuals. The Reading Group enjoyed the sources from Surface Language because they had the words spoken to them in Welsh if they clicked a button. However, Student D of the Reading Group had noted that "Some of the information between articles contradicted each other" which caused some problems on what each Welsh phrase translates to.

The third question was "If you could change anything about this course, what would it be? How can it be better organized?" Students of both the Video Group and Reading Group had noted that the sources should have encouraged studying more through activities or homework. Both of those were not provided. Student B of the Reading Group also suggested that "note taking should have been encouraged" as well to accommodate the variety in learning styles.

The fourth question was, "How were you learning from the resources? How did you budget your time?" Both of the groups went through each source one at a time to obtain all the information from it. There was a contrast as some students then later admitted to rushing through

each source while others like Student E of the video group "Paused the videos and would go back to them a day later to see if I still knew [the information]."

The fifth question was, "How do you feel about Self-Paced learning as a whole? Would you do it again as a full course?" Both group had said that Self-Paced education requires a student to be really motivated throughout their learning in order to benefit the most out of it. Student F of the video group sums this up as "I like it when someone is physically teaching and pushing me." Student C of the reading group added to this as the teacher in a Self-Paced environment should have been their to help more with the learning. Lastly, Student E of the Video Group suggested that Self-Paced education would work better in an English/Math class.

Discussion

The higher scores for the Video Group suggest that this is a better method of learning as more information was retained throughout this process. This connects to the fact that their is the advantage of both hearing and seeing the Welsh phrases. Participants were engaged in audio as the reading group had enjoyed Surface Language because the vocabulary was said in the correct Welsh format. They also enjoyed the visuals as when the grammar videos were merely text on the screen and a voice recording, interest went down. The two students who had gotten zeros in the reading group had skewed the results. The reason those two had not gotten any right was due to motivation and pressure of other school work. This experiment was done at a time where the school play and sports were in session. Even with the two weeks given for each person to do the Welsh work, other assignments made it so they were not as focused in their learning. This correlates to how Student B of the reading group. He had gotten the highest overall score and was not involved in the school play or any sports at all, giving him more time to study and focus.

There still exists the number of questions left blank as the Reading Group had left 6x more than the Video Group. The theory is that since each video is played fully and chronologically the video students are more familiar with the vocabulary. The reading group could skim through each source, as admitted in responses to question four, making it much easier to rush through them without actually knowing the information. A solution to this would have been to separate each test for each unit so students could not go to Unit Two without getting an 80% in Unit One. The Units could have also been cut up into smaller sections so they were more connected and easier to go through.

Leaving less questions blank did not always account for better test scores, as some students in the video group had answered each question but most of their answers were wrong. They would either guess or write down a word in another language hoping it would translate into Welsh. The Reading Group seemed to be more confident in their answers as the ones they did put down were correct.

The higher difference in average scores for Unit Two was only 2.4% which is a negligible number. Both groups had done significantly worse from Unit One to Unit Two. This is understandable as they had been more preoccupied with the material in Unit One first. Again, the test should have been separated between the two units. Aside from the two students with zeroes skewing the data, there is a greater decrease in scores from unit one to unit two in the Reading Group due to the lack of review material. Unit Two consisted of grammar which would require a shift from memorizing vocab to rules on how each sentence works. This was not done smoothly and could be easily forgotten. Overall, student confidence in this experiment did not go well as many preferred a teacher but adjustments could be made to their complaints in further research.

For example, if an actual self-paced class was in the school as opposed to after school as research project, students would be more inclined to study more as it is not optional. They would also be given more time as well. Along with that, a more engaging subject could be picked such as Math which has also been effective in Self-Paced learning. What is most important is that there be a bigger teacher presence in the beginning of the unit so students can adjust to the whole process. If done too abruptly, students will immediately procrastinate and be more preoccupied with their other activities. Short lectures and "small tutoring sections" like the ones from the self-paced French course could also be used to encourage students to learn more and feel more comfortable (Leblanc, 1992 p.4).

Conclusion

Self-Paced Learning can be effective but only with the right setup. Pressure is alleviated as tests do not have set date. This must be done carefully so an appropriate amount of content is contained into each Unit so confidence in one's knowledge is high. Learning on just one topic at a time helps indicate what specific part is difficult so one can study more for it. Self-Paced education has worked in the past for a variety of subjects from Math to World Language and with the added presence of technology today, can be made to be accessed anywhere. Such technology has been able to increase the pace of learning in disabled students. Teachers then become more confident and relaxed using this method. Videos improve students scores more due to their mixture of audio and visuals but reading has also promised a steady growth when done in small units. One can also implement 3d tutors along with videos to garner more engagement and understanding in students. As addressed, time pressures were a problem in that students felt that

they could not complete the course, thus needing some time to ease into the curriculum.

Emphasis on learning habits must be addressed to continue this growth for each student. This

would be provided by the teacher through one on one interactions and homework activities if the

student asks for it. Self-Paced learning offers the tools for success in a subject and one just needs

to learn how to use them. When this is done, Self-Paced learning shines with its flexibility.

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