

How can technology combined with educational theory be used to improve the quality of catechesis in the Lutheran Church?

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ABSTRACT

Catechesis has been a critical part of Christianity since Biblical times, however the adoption of popular educational theories and technology to aid in catechesis has been slow. This research study shows the result of a review of current materials, surveys and in-depth interviews conducted with catechumens and catechists. It establishes that problem based learning, discussion based learning, formative assessment, spaced repetition and gamification can all be combined with traditional catechesis and technology to provide high quality catechesis. It in particular highlights that catechists and catechumens alike are keen to combine new approaches with traditional methods and each see benefits to the use of technology in catechesis.

Author Keywords

catechesis; spaced repetition; education; technology.

INTRODUCTION

The goal of this paper is to provide valuable insight into how technology and educational theory can improve catechesis while retaining the benefits catechesis has provided over centuries.

Motivation

Catechesis, the process of instructing catechumens; defined as new converts to Christianity receiving instruction in basic doctrines of the Christian faith, has been used within the Lutheran church for centuries. It is commonly used as a rite to confirmation for many Lutherans across the world including within the Lutheran Church Missouri Synod (LCMS); one of the largest Lutheran synods at approximately two million members in the USA. Furthermore, it is used in other other branches of Christianity such as Catholicism [6].

Despite a decline in numbers there are still thousands of people undergoing Lutheran catechesis each year [19] and with over 75 million Lutherans worldwide [5] [2] there is a significant

audience for high quality Catechesis. Lutheran institutions have been slow to use technology to advance teaching with few technological resources currently available [19]. Methodology is often considered to be of little importance [13], with the high regard for the content dominating the focus. While it is indeed true that the content of catechesis is of profound importance, the general lack of focus on methodology leaves significant opportunities to improve education within the Lutheran church.

Background

Catechesis has been an established part of Christianity since Biblical times. Biblical examples include Jesus teaching his disciples throughout the Gospels and the conversion of the Ethiopian Eunuch in Acts chapter 8. It was considered a priority for top christian scholars of the distant past including "Origen (Alexandria; 185-254), Clement (Alexandria; 150-215),...,and many others" [20] and famous theologians of the sixteenth and seventeenth century such as "Luther, Calvin, Ursinus, the Westminster Divines, Richard Baxter, and John Owen" [20]. However, its usage has declined significantly over recent generations [17] [16]. Despite this decline, catechesis is still regarded as a vital part of Christian instruction for many, including Catholics and Lutherans [19] [18] with evidence of a link between catechesis and improved performance in religious education [6]. Further, some have attributed the decline of Christianity in western culture with poor catechesis [8] leading modern scholars to urge a return to catechesis to improve Christian education and strengthen Christians in their faith [4] [17].

EDUCATIONAL THEORIES

While there are many educational theories, this paper considers the following methodologies as these were deemed to be particularly applicable to catechesis, the reasons for this are described below.

Spaced Repetition and Gamification

Spaced Repetition works by using the spacing effect; the knowledge that learning is greater when spread over time as opposed to the same content in one go and reinforcing the information learned at optimal intervals [22].

The memorization of key aspects of the catechism have been considered an important part of catechesis for centuries with the ability to recall key information instrumental in improved

learning at higher levels [15]. While key, it is rare for memorization to be considered particularly engaging, to help with this, the aim is to combine it with gamification defined as *"the application of typical elements of game playing (rules of play, point scoring, competition with others) to other areas of activity."* [10], a popular method for improving engagement.

Research has highlighted that spaced repetition can promote efficient and effective learning in classroom settings, showing this technique can work well within a blended learning environment [14].

The usage of gamification within spaced repetition is a popular method for improving student engagement [27]. A particularly popular and successful application of this in the education space is through Duolingo which uses different levels, milestones and badges to encourage the user to progress [11]. Another very popular application is in the chat based app Snapchat with its use of 'snapstreaks' to encourage users to 'snap' with one another on a daily basis [1].

Problem Based Learning

Problem based learning (PBL) is a methodology where students use "triggers" from a particular problem in order to define their own learning objectives [26]. It is a very popular learning technique with the potential for applicability in almost any field and has been shown to be an excellent method to engage students and has been found to be both successful and preferred to traditional learning approaches in a variety of studies [24] [21].

Discussion Based Learning

Discussion based learning (DBL) is a methodology that prioritises learning through discourse rather than passive approaches [9]

It can be applied in a variety of different methods including:

- Large scale conversations such as open forums;
- Instructor led, small group discussions;
- Peer to peer discussions.

Discussion based learning is common within Christian circles, with Bible studies, usually taking the form of small group discussions and hence is likely to be accepted as a method for catechesis.

Discussion Based Learning has been shown to have significant benefits in online learning environments [25]. It is a method that is used widely, including through Piazza, in the Georgia Tech OMSCS program. Technology and mobile applications have proven to be very effective in this area with popular applications such as WhatsApp, Slack and Quora offering this functionality on a wide scale.

Formative Assessment

Formative assessment is the use of assessment to provide feedback to students and teachers during the learning process and allows for adjustments to be made based on the feedback in order to improve the learning experience. [23]. It has been shown to produce significant learning improvements across all

ability groups with a larger benefit for low achieving students and those with learning disabilities [3]. Within the online learning space, formative learning is used frequently in MOOC courses, through in lecture quizzes to help the learner ensure they have understood the concepts and has been shown to be an effective method in both blended, online [7] and mobile based learning [12].

METHODOLOGY

The research approach for this project consisted of primary research focused on a review of currently available materials, surveys and interviews with catechists and catechumens.

Review of Current Materials

The first of these was designed to gain an understanding of the current landscape. To find resources, the following were used:

- The website <http://lutherancatechism.com>; which is dedicated to the promotion of Luther's catechisms;
- Concordia Publishing House, a large Lutheran publisher, connected to the Lutheran Church Missouri Synod.
- The Google Play Store and the Apple App Store.
- Resources highlighted by catechists and catechumens who responded to surveys.

These resources were then considered with a focus on the quality, accessibility, potential applicability to certain educational theories and their use (if any) of technology.

Surveys

Three surveys were performed, all of which were made available via Google Forms, the first two were aimed at catechumens, one for those below thirteen and one for those thirteen and above. The final survey was created specifically for catechists. The surveys were designed specifically for those who had experienced catechesis themselves, either as a catechist, current or previous student within the Lutheran tradition and were part quantitative and part qualitative in nature.

Survey Questions

Catechist and the catechumen surveys were similar with the general difference being the focus being on either the catechist or the catechumen and their impression in the associated role. Each of these survey was split in to the following five sections:

- Demographics - Used to allow for analysis across different demographics;
- Experience with Teaching - Designed to get an understanding of how the respondent had experienced catechesis themselves as catechist or catechumen;
- Memorizing the catechism - Designed to understand the importance the catechumen or catechist placed on memorization and their opinion on potential alternative methods in terms of effectiveness and enjoyment;
- Understanding the catechism - Designed to gain understanding of aspects catechists or catechumens found important, along with questions related to key educational theories (PBL, DBL, Formative Assessment);

- Final Questions - A general question on how the respondent believes catechesis can be improved within the Lutheran church and a request for contact details for further contact about a possible interview.

In total the catechist survey contained twenty-four questions (seventeen quantitative and seven qualitative) whereas the catechumen survey for students thirteen and over contained twenty-five questions (fifteen quantitative and ten qualitative)

Demographically the surveys covered a wide range of age groups in both the catechumen and catechist responses as indicated in the figures below:

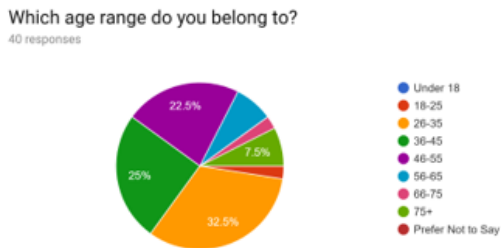


Figure 1. Catechist Survey Age Breakdown

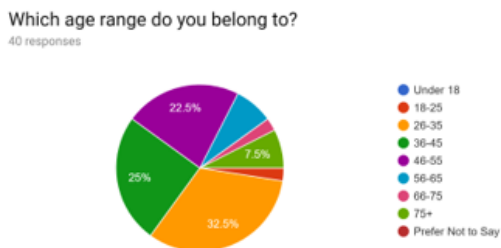


Figure 2. Catechist Survey Age Breakdown

The survey for those under thirteen, was a shorter survey (ten questions, seven quantitative, three qualitative) designed predominantly to understand the students direct experience with catechesis, in particular how lessons were taught, materials used and what the catechumen enjoyed and did not enjoy.

Furthermore, within the catechist survey, while catechists who were Pastors provided the majority of responses (30), as would be expected given they tend to commonly be catechists within congregations, a number (10) of non Pastors also contributed, the majority of these were made up of Sunday school teachers and parents.

Catechumen respondents were closely split between respondents from the United Kingdom and the USA, with one response from Germany. Catechist surveys however were overwhelmingly from the USA (approx. 90%), one possible reason for this is the large number of English speaking Lutherans and the consistency in catechesis within large Lutheran synods such as the LCMS. While it is not believed this demographic will have had a significant impact on results, at least in other westernised countries, further research would be required to confirm this.

Interviews

Interviews were conducted with nine individuals, five catechumens and four catechists. Interviews took place via a variety of methods as preferred by the individual, methods used included in person, by telephone, via WhatsApp and via Email. In each case, the same interview script was used and deviated from only for further clarifications to survey responses, to aid understanding or consider ideas further. The interviews were qualitative in nature with the aim to:

- Focus on the use of spaced repetition and benefits this could provide;
- gain a deeper understanding on the use of potential educational theories and technology through the use of example questions;
- Understand any potential socioeconomic concerns to the use of technology within catechesis.

FINDINGS

Review of Current Materials

The majority of current materials are based on paper and tend to focus on children and teenagers, this is likely due catechesis generally being performed by Pastors in a church setting as a rite for confirmation, often between the ages of eleven and fourteen. Given the target audience, it is somewhat surprising, that uses of technology within catechesis are rare, though as previous research [16] [13] indicates the high value placed on content over methodology this becomes closer to expectations.

It should be noted that there are exceptions including the significant contribution to Lutheran Catechesis from T. R. Halvorson and the dedicated website for promoting the use of Luther's Catechisms at <http://lutherancatechism.com/>. This centralised area for resources is highly valuable with the majority of other options scattered and difficult to find. Furthermore, high quality materials, and usages of technology do exist, including podcasts from Concordia Catechetical Academy, simple mobile apps and even online courses published by Concordia Publishing House at <https://cphfaithcourses.com>.

Examples of resources that are either currently using or could easily be adapted for problem and discussion based learning, along with formative assessment are plentiful with both traditional resources, such as Luther's catechisms themselves and modern resources such as the book and accompanying online course 'Echo' by Pastor Jonathan Fisk. The above provides good confidence that Lutherans are prepared to embrace modern techniques and practices within catechesis alongside more traditional methods.

Survey Results

Memorization

Importance of Memorising the Catechism

Memorization has been a key aspect of catechesis for many years, with the ability to recite parts, or even all of the catechism, a common expectation. The survey results highlight, as shown in figures 4 and 5 above, general agreement amongst both catechumens and catechists of the importance of this aspect.

How important do you believe it is for catechists to memorise the following parts of the Catechism?

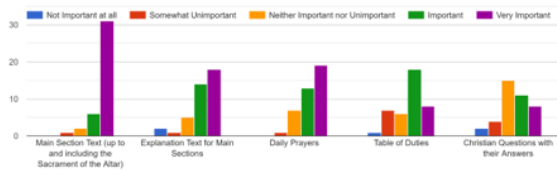


Figure 3. Catechist - Memorization

How important do you believe it is to memorise the following parts of the Catechism?

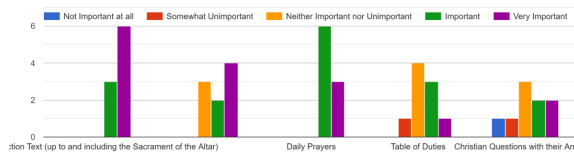


Figure 4. Catechumen - Memorization

Effectiveness and Enjoyment of Catechism Memorisation Methods

How effective do you believe the following methods would be in helping students to memorise the catechism?

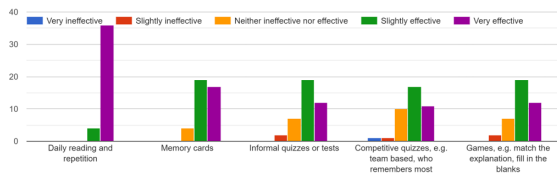


Figure 5. Catechist - Memorisation Effectiveness

How effective do you believe the following methods would be in helping you and other students to memorise the catechism effectively?

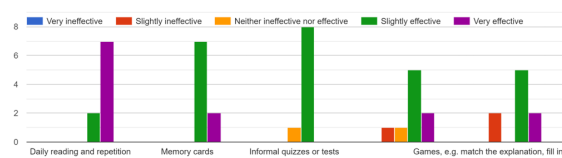


Figure 6. Catechumen - Memorisation Effectiveness

With regard to the most effective and most enjoyable methods for catechesis, an interesting inverse relationship between effectiveness and enjoyment is observed in both groups. The traditional reading and repetition is regarded as the most effective but least enjoyable and the usage of games to be most enjoyable but least effective. Interestingly, however, overall all methods were considered to generally be both engaging and enjoyable.

How effective do you believe the following methods would be in helping students to enjoy the memorisation aspects of Catechesis?

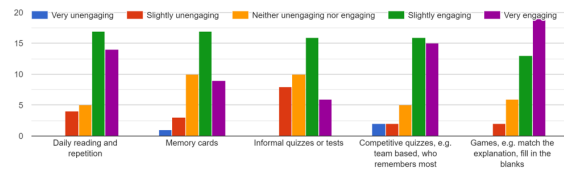


Figure 7. Catechist - Memorisation Engagement

How effective do you believe the following methods would be in helping you and other students to enjoy the memorisation aspects of Catechesis?

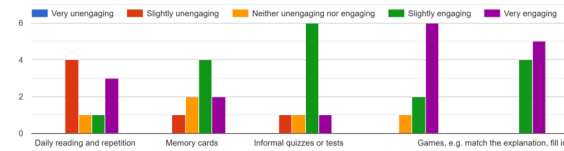


Figure 8. Catechumen - Memorisation Engagement

The above results show positive responses towards a variety of different methods for memorizing the catechism. This shows openness to the use of different solutions or to combine approaches as is most appropriate for particular student. The results are also indicative of a positive response towards gamification and formative assessment, with a combination of these and the traditional reading and repetition method likely to provide the best balance of effectiveness and engagement.

The importance of engagement along with effectiveness should not be underestimated, particularly with increasing religious disaffiliation in western cultures and with over 50% of catechists in the survey highlighting they do not believe the students enjoy the memorization aspects of catechesis there are most certainly opportunities for improvements in this area.

Catechism Memorization and Technology

How much do you believe a mobile phone app providing the following would help students in memorising the catechism?

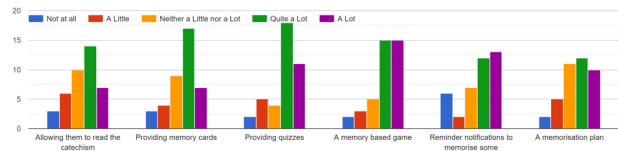


Figure 9. Catechist - Mobile Memorisation

Three mediums were considered within the survey, use of a mobile app, an online solution and the use of voice based assistants such as Amazon Alexa. All options were considered positively with the mobile app equivalent being more popular than the online equivalent in each case. Voice based assistants were very popular (100%) among catechumens, however catechists were less sure with over half either of the opinion that

How much do you believe an online application or website providing the following would help students in memorising the catechism?

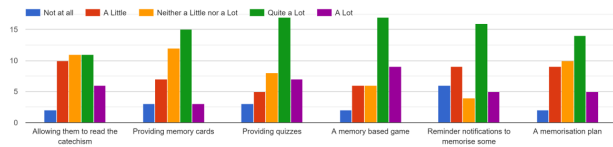


Figure 10. Catechist - Online Memorisation

How much do you believe a mobile phone app providing the following would have helped you or other students in memorising the catechism?

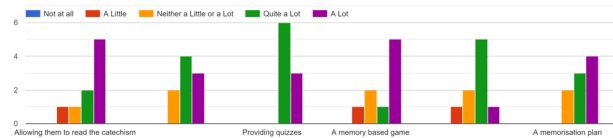


Figure 11. Catechumen - Mobile App for Memorisation

How much do you believe an online application or website providing the following would help you or other students in memorising the catechism?

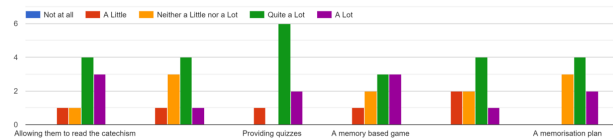


Figure 12. Catechumen - Online Memorisation

voice based assistants would not be effective or unsure of their effectiveness. As this is an emerging technology, it is expected these results may improve over time and a more detailed study of their use within catechesis could be a good candidate for future research.

Understanding the Catechism

How effective do you think the following would be in aiding students to better understand the catechism?

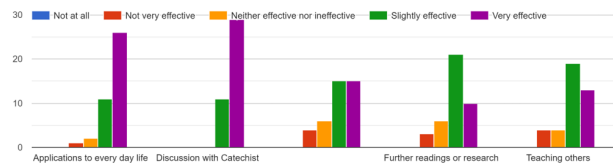


Figure 13. Catechist - Methods for Understanding

Problem Based Learning

Two options, particularly framed towards areas that could use Problem Based Learning were offered in the survey, the first, application to every day life and the second further readings or research. With catechists and catechumens alike, both of these were popular, with applications to every day life being

How effective do you think the following would be in helping you or others students to better understand the catechism?

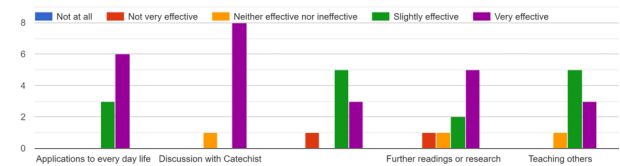


Figure 14. Catechumen - Methods for Understanding

particularly popular and described as 'very effective' by the majority of both catechumens and catechists and bested only by the traditional method of discussions with the catechist. With the catechist likely to be the facilitator in problem based learning, combining these discussions with applications and readings and research is likely a strong option to enhance catechesis.

Discussion Based Learning

Catechesis has traditionally been taught using a discussion based learning approach between catechist and catechumen and the value of this approach is clearly highlighted in the results with a significant majority believing this method to be 'very effective' in the survey results. Discussions with other catechumens (the third option in Figures 14 and 15) was also looked on positively with a majority believing it to be either slightly or very effective, though without the significant slant toward very effective as seen in the discussion with catechists. These results are strongly indicative of both a desire and belief within catechists and catechumens alike that discussion based learning is the ideal method for catechesis.

Formative Assessment

How effective do you think the following are for checking a students understanding during Catechesis?

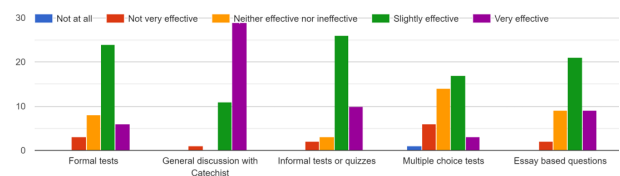


Figure 15. Catechist - Assessing Understanding

Several methods for assessment were provided in the survey, as indicated in Figures 16 and 17. The most popular method, with a significant majority believing the method to be 'very effective' was general discussions with the catechist, however all methods were considered effective by the majority. Each of the methods could be used for formative assessment, though the two most popular (general discussion with catechist, and informal tests or quizzes) are methods that generally are used for this type of assessment, highlighting a positive view towards formative assessment amongst respondents.

How effective do you think the following are for checking understanding during Catechesis?

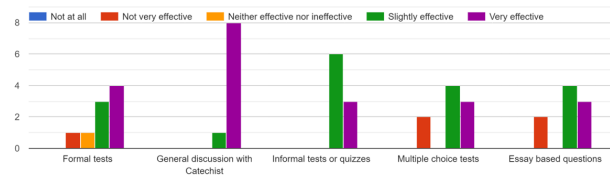


Figure 16. Catechumen - Assessing Understanding

Improving Catechesis

Three main categories were highlighted as options for improving catechesis. These were: Continued learning and applicability to everyday life; Involvement of parents; and use of technology.

Continued Learning and applicability to everyday life

The below show their is still a significant desire for catechesis from both catechists and catechumens and for this teaching to continue beyond the traditional confirmation class approach.

"while catechesis is certainly necessary for confirmation in the Lutheran church, it shouldn't just stop once you're confirmed."

"... If catechesis is treated as having an end date, parents and students may begin to act as though they have "graduated" from church."

"(It is important to learn) how we should live according to the catechism"

Involvement of Parents

The involvement of parents in catechesis was considered to be very important by a number of catechists. As the original intention of Luther's small catechism was for use by the head of the household to teach, this would be fitting both with the initial intention and general educational research highlighting the importance of parental involvement in education.

"Keep the parents involved"

"I'd like children's catechesis to be done especially by parents"

"... educating the parents to teach their child at home as it was meant to be done"

Use of Technology

Along with the positive response to the use of mobile, online and even voice based assistants within the survey. Several comments highlighted technology specifically as a method to improve catechesis.

"A mobile app sounds excellent. I always have my phone on me!"

"Having an app might help get more people reading and speaking the chief parts of the Faith."

"if it's true we're moving from a literate culture into an audio-visual culture, videos, graphics, and stories will be preferable to dry textbooks"

"Live online classes, youtube, Facebook group (daily questions competition) and/or DVD series taught by Pastors who can relate to unchurched or not primarily Lutheran w/o losing significance of our Lutheran doctrine and heritage"

Interviews

Spaced Repetition and Gamification in Memorization

The use of spaced repetition was a welcomed approach by the majority of respondents with one respondent "all for different ways to aid memorisation" (John Dunning), it was described as a "...welcomed sight" (Pastor Hercamp) and "done in other areas successfully" (Paul Thomas). No respondent was against the idea of using spaced repetition, though one felt it was unnecessary as they "don't actually think memorizing the catechism is hard for most children" and that "it is really a matter of doing the work and the parents helping with it" (Catechist Interviewee 3).

Gamification, described by example, in the interview as using a points based system for correct answers, answering quickly, correct answers to previous incorrect answers and regular completion to aid memorisation was also considered positively "I love this idea..." (Pastor Schmidt). The most appropriate methodology however was more varied in opinion with "stickers... better than points" (Michelle Harrison) and "I love... the points based system" (Pastor Schmidt). Respondents were in general more keen on rewards based on correctness as "time based method may make it interesting or exciting but puts the focus in the wrong place" (Paul Thomas) and "may induce mistakes... and quick recall is not as important as accuracy." (Daniel Simojoki). Rewarding regular completion was particularly popular as it "would encourage regular use" (Paul Thomas) and "is a big deal as it points to the ability to maintain a constant activity from day to day." (Sarah Crawford), a comparison was also made to the Duolingo app in support of this and "making the catechumens do 3-5 activities to keep the streak alive would be a good thing." (Pastor Hercamp).

For the majority (approx. 80%) who considered gamification to be worthwhile it was commonly considered that a mobile app would be best as this "would work well in the app environment" (Michelle Harrison) and accessibility was a large factor with respondents feeling it was "...easiest to use and access from a mobile device" (Daniel Simojoki) and "...always available" (Michelle Harrison) and "every student this year had an iPhone." (Pastor Schmidt).

Two interviewees, both catechists, were against the use of gamification within catechesis with the belief that it is "much better to tell the kids and their mothers and fathers that this is worth doing" and the learning should be regarded as a "crucifixion of the flesh" (Catechist Interviewee 3) and would "prefer the parents sit with the children and do this. Remember Dr Luther: 'as the head of the family should teach.'" (Roni Grad). Both of these point towards social concerns regarding the use of technology and particularly the replacement of parental involvement within catechesis. These are important concerns

highlight the importance of technology supplementing, rather than replacing traditional approaches.

With regard to the effectiveness of using technology there was a predominantly positive opinion on these methods to improve catechesis in effectiveness due to "...the ability to access instantly." (Michelle Harrison) and be "more engaging especially to younger learners." (Daniel Simojoki). A blended learning approach was also popular, "(The church) can definitely bring people in with the more modern methods, but also incorporate the traditional means." (Sarah Crawford) and can "... give the catechumen more activities outside of the class time to help memorize/reinforce what was taught in the class." (Pastor Hercamp).

Discussion Based Learning

Discussion based methods were considered effective by all those interviewed with wide ranging reasons from community based reasons such as the "feeling of not being alone" (Michelle Harrison), with "a group mentality attitude, leads to identification socially." (Paul Thomas) and for "...viewpoints to be shared" (Sarah Crawford). Formative assessment approaches were also highlighted providing "...opportunity for them and the catechist to test their understanding of a catechetical concept right after it being taught" (Pastor Hercamp), and to assist in the learning process through "refining their thinking" (Catechist Interviewee 3). The importance of the environment feeling safe was a particular factor in the success of this method, with respondents highlighting that it "needs to feel safe." (Michelle Harrison) and "a safe place to confess and even be wrong at times." (Catechist Interviewee 3).

Several different methods for using technology to aid discussion were proposed to the interviewees including, using social media, a real-time, chat room, collaboration or communication tools, such as slack and non-interactive forums. There were wide-ranging opinions on each method, "I think Facebook and many other similar social media platforms are awful" (John Dunning) and "this (social media) is the common method used for communication and has become the natural method." (Paul Thomas) while the importance of effective moderation was important within other methods "Moderating would be important." (Paul Thomas).

An important factor here was that the majority of respondents preferred traditional communication methods, with the majority believing "nothing that can truly replace face-to-face interaction." (Sarah Crawford). One interesting option, suggested by Sarah Crawford, was the use of moderated real-time conversations with the ability for questions to be asked anonymously and responded to by the moderator. This method is worthy of further consideration as it is closest to the traditional discussion methods used within catechesis and an effective solution to concerns raised with the proposed methods.

Problem Based Learning

Problem based learning based on using the catechism as a basis for answering key questions was popular among all interviewees, using it to encourage "...students to learn how to defend the faith from a deep knowledge of the Scripture," (John Dunning), otherwise there is a risk of faith "becoming

lifeless and unimportant to them, and powerless to produce true godliness in their lives.". It was also believed that this approach "would make learning much more interesting" (John Dunning) and the "less formal" (Michelle Harrison) approach is more conducive to life long learning.

With regard to the type of questions that would be suitable, questions supplied by the author were considered positively and many other questions were provided by interviewees, the full list of these is provided in Appendix A and are recommended as a good starting point of a compilation of questions for future catechesis lessons. This also shows the ability of catechumens (who provided over 50% of questions) to define their own problems as is common in PBL.

An important consideration related to the best methods for supporting students in problem based learning, four options were provided to interviewees:

1. Allowing students to submit written answers for review by a Pastor/Teacher;
2. Providing students with an online forum to discuss the above questions.
3. Providing sample answers to the above questions via a mobile app;
4. Providing sample answers to the above questions via the internet.

There was significant variance in the most appropriate approach with two respondents believing neither would be useful as this is better done "in-person" (Roni Grad), however all other interviewees saw value in at least one of the approaches with the most popular being to provide answers via a mobile app, though there were concerns around this with thoughts it would be "better to not have a standard answer" (Michelle Harrison) and could lead to people giving 'pat' answers when sometimes "more than a 'pat' answer is needed" (John Dunning). A key consideration and benefit of these approaches was that "they allow students time to think about their answers" and stops them "being put on the spot and only being able to come up with a one or two word response" (Pastor Schmidt).

There was a mixed, but predominantly positive, response to whether this method would be more effective and enjoyable than traditional methods, with thoughts that it "shouldn't replace traditional methods" (Pastor Hercamp) but would "allow for continued learning which isn't currently available" (Michelle Harrison) and "is more accessible" (Paul Thomas).

Formative Assessment

The use of formative assessment, via short questions following reading was universally popular with these seen as a benefit "for the purposes of retention and assessment," (Pastor Schmidt) and it "reinforces learning" and provides "affirmation rather than assessment" (Michelle Harrison), while "solidifying what the student has read" (John Dunning). Adding gamification to the process through the use of points or rewards was well received with it thought to "add a little colour

to the whole process" (John Dunning) and likely to be "effective for motivation" (Daniel Simojoki), "as in memorisation" (Michelle Harrison).

The opportunity for formative assessment through deeper questioning was less universal in its popularity, with the belief that one respondent did "not believe the majority of people would use it." (Michelle Harrison) and that students "...might ignore it" (Paul Thomas). Furthermore, it was considered that these types of questions are "better done in person" (Catechist Interviewee 3) and are "more effectively spoken to the teacher" (Daniel Simojoki). However others believed that it "allows the student to give a thoughtful answer without the pressure of asking in front of a large group of people." (Sarah Crawford) and that it could "steer the student to allow God's Word to actually begin to shape their life in a godly fashion" (John Dunning).

Improving Catechesis

Interviewees had a variety of ideas for improving catechesis with the most popular ideas mirroring those from the survey.

Parental Involvement

The most commonly mentioned improvement related to the role of parents within catechesis, with the belief that it was important "to keep the parents front and center" (Roni Grad) and "improving the confidence of the catechumen's parents in the faith", with the belief that the "more the parent is involved ... the more likely it is to stick" (Pastor Hercamp) and that it would "benefit the Church greatly to encourage, equip, and help parents train their children in the way they should go." (Pastor Schmidt)

Continued Learning

A positive encouragement to catechists from my research is the desire of catechumens and catechists alike for continued catechesis. This desire includes wanting "continued learning" (Michelle Harrison) and a "continuity and a constant reminder to those already confirmed" (Sarah Crawford) with a view "to remember the information long term" (Daniel Simojoki). It was noted that catechesis should be "a life long endeavour" and that we "barely scratch the surface" (John Dunning) of what there is to learn.

Technology

There is a desire for the use of technology within catechesis, with the majority of interviewees highlighting a mobile app as the preferred method, to allow for it to be "more accessible and flexible" (Daniel Simojoki) and could be used in differing circumstances such as "on commute" (Michelle Harrison) through providing the user with "accurate answers to the most asked questions about Christianity" (Sarah Crawford).

There were however some concern about the role of technology within catechesis, with some respondents seeing a "minimal role, if any" (Roni Grad) and other concerns included costs (to individuals or churches) and potential parental concerns over children. Despite this, the majority (approx. 80%) saw benefits in the use of technology. It was highlighted that the role of technology "should not replace teaching..." (Michelle

Harrison) be that from the Pastor or parental involvement but rather to supplement and enhance it.

CONCLUSION

Technology, combined with educational theory, has great potential to improve the quality of catechesis within the Lutheran church. It will, however, require careful consideration in its use to retain the traditional benefits of catechesis achieved through parental involvement and direct, often one on one, teaching from catechists.

The usage of spaced repetition and gamification was believed to be both effective and engaging for students to aid in the memorization aspects. Discussion Based Learning, Problem Based Learning and Formative Assessment are all thought of positively by catechumens and catechists alike. The use of technology in support of each method was considered likely to improve opportunities, along with both the effectiveness and engagement it provides to students, especially, when combined alongside traditional methods in a blended learning environment. A mobile app is currently the favoured method of interaction, however there is potential acceptance of other technologies including voice based assistants.

The desire for catechesis among catechumens and catechists, along with the options available through modern educational approaches and technology, provides an exciting opportunity for Lutheran's to provide a more effective and enjoyable experience for catechumens and perhaps reverse the trend in declining catechesis.

Further Research

There are several areas for further research following this paper, in particular:

- Extending this research to provide more detailed guidance on the most appropriate use of each educational theory and technology within catechesis;
- Consideration for how to effectively combine technology with parental involvement;
- How voice based assistants, particularly with the use of natural language processing could be used to further improve catechesis.

ACKNOWLEDGMENTS

Throughout this paper I have received vital help from numerous people. I would like to thank my mentor Kaitlyn Fulford for keeping me on track and providing valuable guidance and to Pastor Simojoki for assisting in gathering respondents to surveys. In addition, I would like to thank all those who completed surveys and participated in interviews, your input was invaluable to the completion of this paper.

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APPENDIX A - QUESTIONS FOR PROBLEM BASED LEARNING

The below questions were raised either by the author or by interviewees as interesting questions for use in problem based learning for catechesis.

1. Suppose you have a bad mother or father - what does it mean to honor them?
2. How should we think of capital punishment in light of the commandment 'Thou Shalt not murder'?
3. What does the Catechism have to say about creation and how does this apply to modern scientific theory?
4. How would you explain the key points of the creed to someone who wasn't familiar with Christianity?
5. If we pray 'Give us this day our daily bread?', why is it that sometimes people suffer and die?
6. At what age should you get Baptised and why?
7. How do I apply the ten commandments to everyday life?
8. How to be a Christian in a workplace or friendship group without other Christians?
9. How God can be called loving, when He allows such suffering in the world?
10. How can we find joy and peace in the midst of suffering and persecution for being a Christian?
11. How we can know and trust the Bible is true and infallible?
12. Why should we believe and trust in Jesus Christ, even at the cost of rejecting what popular opinion and modern science have to say?
13. Why are we here?
14. What is our purpose?
15. What about if you're not Christian?
16. What about other religions?
17. How should we keep the sabbath holy?
18. In what way should we honour those in authority that we do not respect?
19. How do we minister to those who are suffering in a meaningful way?
20. If faith is a free gift, why do some people reject it?
21. Why are we fractured as a Church (stressing the importance of doctrinal purity)?
22. We pray Thy Kingdom Come, so how does it come? And what is different about God's Kingdom from the kingdoms of the world?
23. The Red Cross asks for blood donations, and the blood that we give is then given to someone else by a blood transfusion. How does this image help us understand what happens in the Lord's Supper?
24. How should we look at tabloid magazines in light of the 8th commandment?
25. How should we respond to some one who encourages us to "follow our heart" in light of the 9th and 10th commandments?