Print-On-Demand in Book Publishing in South Africa for the Past Decade

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Abstract

The aim of the research is to investigate the use of print-on-demand (POD) technology and to describe the challenges and benefits of using POD technology in South Africa compared to the rest of the world. In light of technological advancements in the 21st century, the research gives an account of the progress made in the use of POD technology from the perspective of trade publishers, printing entities, booksellers, self-publishing providers, academic presses and from university libraries in the past decade, from 2009 to 2019. According to research findings, POD is useful for reprints, self-publishers, academic presses and trade publishers. However, there are notable disadvantages when it comes to quality and page limitations that makes POD not an ideal option, especially for certain genres like cookbooks or graphic books with high resolution images. The distinguishable differences with authentic POD, short-run digital printing (SRDP) and offset printing gives the publishing industry options that affects cash flows, accessibility, demand of books and added value to end users.

Keywords

Print-on-demand; short-run digital printing (SRDP); digital technologies for printing; Kindle Direct Publishing; Espresso Book Machine (EBM); printing for less than 500 copies; print-on-demand for self-publishing.

PLAGIARISM DECLARATION

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- I have followed the required conventions in referencing the words, thoughts and ideas of others.
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Signature: Thomas Mabaso Date: 08 August **2020**

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Chapter 1: Introduction

The brief overview of what the research is about is outlined in this chapter. In this essay, the advancement of digital technologies is discussed by gathering research about print-on-demand (POD) and other printing technologies in the juxtaposition of printing books in the digital age from 2009 to 2019.

1.1 Purpose

The aim of the research is to investigate the use of POD technology and to describe the challenges and benefits of using POD technology in South Africa (SA) compared to the rest of the world. Pierre Danet (2014, p. 276) states that 'the World Wide Web is both a kind of publishing mechanism and is also somewhere a perfect system for the distribution of what every human could publish.' Tech companies like Amazon, Microsoft, Apple, Google and Adobe Acrobat are advocating for wider access and the ability to make electronic books (ebooks) and electronic textbooks (e-textbooks) easily available through various devices, such as Kindle E-readers and iPad's and online platforms like Adobe Reader and Microsoft Reader's (Embong et al., 2012; Olsen et al., 2013; Tsai, Lin, & Su 2011). Which means that it will be more difficult for publishers and booksellers to predict demand, since students and the general public will opt for the best option or alternative ways of getting information. The research will determine the use for POD for book printing, which will help publishers, self-publishers, printers, academic presses, university libraries, booksellers and the general public to access printed books. The research will further help writers to understand the options which are available to them in relation to printing the physical book in the oversaturated digital environment (Danet, 2014; Hall, 2013).

1.2 Problem Statement

POD is one of the technological advancements which aims to advance the publishing industry to greater levels of dissemination of books worldwide (Hall, 2013; Greco, 2015; Thompson, 2005).

Despite the growth of electronic publishing (e-publishing), the physical book still carries more worth in most cases (Healy, 2011; Carolan & Evain, 2013). The success of few ebooks in South Africa and globally— created the impression that printed books would be obsolete, but the print format still prevails (Gaigher et al., 2014). Another problem is with regards to metadata management tools, which will need to be more effective in the oversaturated digital environment (Hall, 2013; Turner, 2014; Thompson, 2005). However, industry experts suppose that the biggest challenges are digital right management (DRM), content discoverability and ensuring that consumers get access to the right version of the book, instead of the pirated version (Magadán-Díaz & Rivas-García, 2018; Hall, 2016).

POD is instrumental in inventory management and for supply chain management, especially when considering the shorter lifespan of books in bookstores worldwide for the academic, trade and self-publishing sectors (Hall, 2013; Greco, 2015, Shao, 2016). It is crucial to understand and define POD, according to how it directly meets the stakeholders needs by supplying books that are scarce or hard to locate for the end users or consumers. The aim of the research is to determine how demand is fulfilled by the different stakeholders. And to assess how POD technology is used and what are the challenges and benefits of using POD technology in South Africa compared to the rest of the world? This is the main problem statement which the essay explores in this research report.

1.3 Objectives

The aim of the research is to investigate the use of POD technology, and to describe the challenges and benefits of using POD technology in South Africa compared to the rest of the world. The investigation is centred on trade publishing sector, printing entities, booksellers, self-publishing providers, academic presses and university libraries from 2009 to 2019. The research aims to uncover the following:

- The utilisation of POD technology.
- The availability of POD in South Africa.
- The benefits of using POD technology compared to offset printing.
- The challenges of using POD technology compared to offset printing.
- The cost implications of using POD technology.
- The quality of POD technology compared to offset printing.

- The helpfulness or ineffectiveness of POD technology.
- The investment of and in POD technology.
- The affiliations with POD service providers or entities.

1.4 Conclusion

It is important to define the printing methods that are available for the stakeholders who supply the demands of books to the end users or consumers. The literature review will embark on reviewing existing research on POD worldwide. This will help to create a methodology to follow in the investigation of POD for the South African book market.

Chapter 2: Literature Review

This chapter outlines important concepts that have been uncovered through the literature reviewed about the availability and utilisation of print-on-demand (POD) and short-run digital printing (SRDP) in relation to the conventional way of printing books. It also explores business concepts and strategies that will outline the benefits and challenges of how effective digital printing technology has been.

2.1 Defining Important Concepts and the Changes in Trade Publishing

Covering the basic definitions and outlining the business concepts of how publishing has moved from the trade publishing sector to enable multiple sectors will help in understanding all the digital technologies that have made it possible for the publishing industry to grow. This will also give an expansion of how all the stakeholders have been affected by digital technologies.

2.1.1 Defining Offset or Letterpress Printing: Conventional way of Trade Publishing Printing

Ann Haugland (2006) states that digital printing has emerged from the 1990s to enable publishers to have alternative solutions to offset printing option, whereas in the past, publishers risked ordering thousands of copies of a book title without guarantee of success. Offset or letterpress printing involves preparing metal pressure plates that have a page-by-page replica of the actual text file, which is regarded as the conventional method of printing the first print run of a book title with quantity units of more than 1,000 copies (Hall, 2013; Greco, 2015). The initial cost for conventional printing is expensive, due to the preparations of the pressure plates for the first print run, however, the subsequent unit cost is cheaper (Tzouvaras & Hess, 2001). Frania Hall (2013, p. 9) states that ‘While the offset or letterpress printers are cheaper per unit cost for high print numbers, the time it takes to get them set up for small print runs is not commercially viable.’ Offset printing is the conventional method that can meet the demands of popular book titles by maximising profit margin for the publishers, booksellers and printers, while keeping the unit cost cheaper as higher quantities are demanded. In the past it was the only method available to big trade publishers.

2.1.2 Defining Traditional/True Print-on-demand or Print to order

Print-on-demand (POD) is defined as a system that can print small or individual numbers of copies by using digital printing technology (Wilson-Higgins, 2017). The growth of digital publishing is due to portable document format (PDF) experimentation which enables new distribution channels, as the process of making and receiving books is made easier (Seita, 2017). These files can be transferred easily to the printing company via email or through their printing management system. PDF files are supplied by publishers or authors to POD printing entities and stored on their system (Hall, 2013; Warner, 2017). Digital printing requires the use of an ink jet printer or toner printer, which directly transfers ink to the selected paper stock from the files supplied by the customer to the printing entity (Seita, 2017, Chang, 2017). The biggest advantage is that there is no need for the preparation of pressure plates when using digital printing (Chang, 2017, Hall, 2013). Print to order (PTO) or true POD is the printing of a single book from a digital system that can be occupied in a library, bookstore or printing plant when the book title is demanded by the end user (Gallagher, 2014; Chang, 2017).

2.1.3 Defining Short-run Digital Printing (SRDP) and Tipping Point

Short-run digital printing (SRDP) model is a digital printing system that also uses an ink jet printer or toner printer to print small quantities of a title that are more than two, but less than 500 or 1,000 copies, which is depended on the tipping point between offset printing and digital printing methods for the publisher (Hall, 2013; Chang, 2017; Warner, 2017).

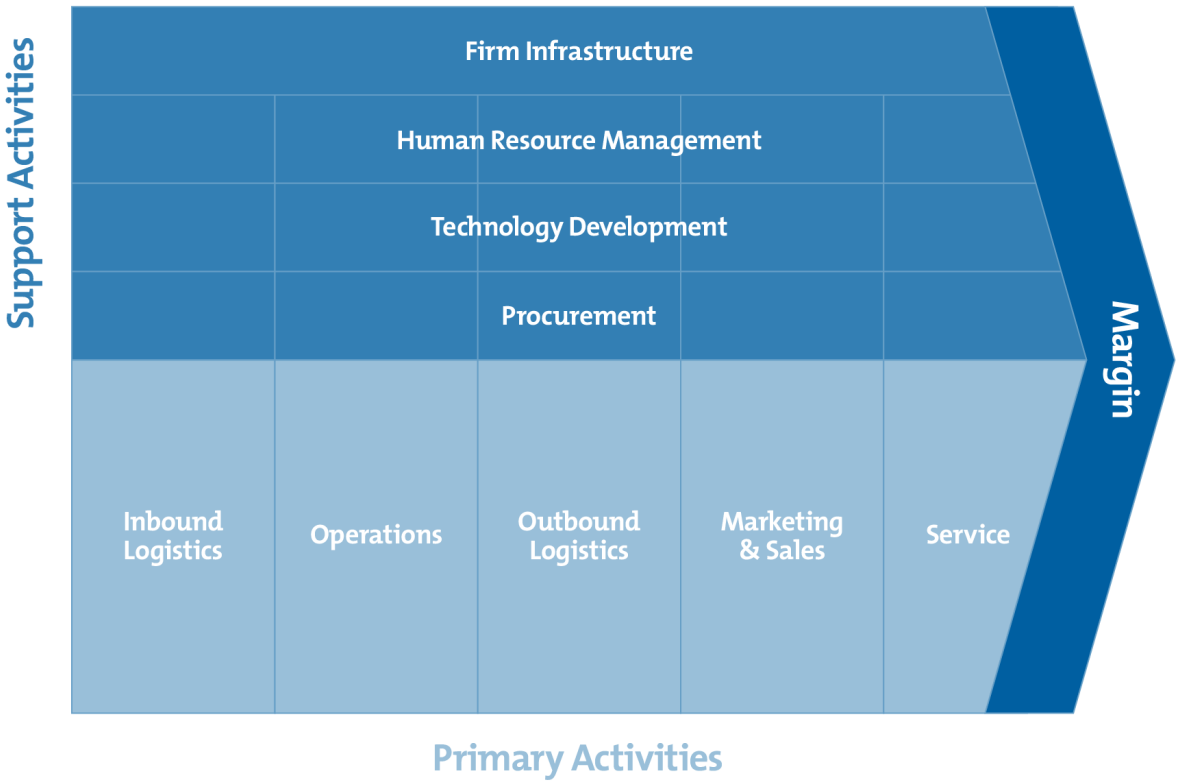
The tipping point is the mark that the unit cost for quantity of books printed through digital printing would be more suitable to traditional offset or letterpress printing (Hall, 2013; Bullock, 2012). Chang (2017) states that PTO or true POD (Gallagher, 2014) is synonymous to SRDP and the publishing industry refers to both methods as POD, since the method of printing is the same.

2.2 Business Concept that Impact the Supply Chain in Publishing

Michael Porter's (1985) value chain analysis is considered based on how organisations create value for customers in the digital age by introducing POD technology. While the "Long tail" method by Chris Anderson (2006) is ideal for print books that are not readily available through brick-and-mortar booksellers. Similar business models discovered through the literature review are discussed.

Michael Porter's Value Chain System — adds value through the primary activities that are linked to supportive activities to the business inherent value chain system (Porter, 1985).

Figure 1 **Porter's Value Chain System**



Source: (Porter, 1985)

Inbound Logistics — One of the advantages is in relation to the small number of books that can be made available by trade publishers from their suppliers who offer SRDP or POD services (Porter, 1985; Warner, 2017). The skills and support from procurement and human resource department is paramount in order to use the correct technology for the added value in the supply chain, while remaining profitability (Porter, 1985). Porter's (1985) model for inbound is in relation to distribution, processing raw material and storage of products or service for publishers and printers (Porter, 1985). The model is also like models that relate to digital printing for the stakeholders. For example, Birkenshaw (2003) refers to the *conventional method* for POD or SRDP as the ability to print individual or small quantities of books by using a print company, while the *virtual method* is the utilisation of warehousing, distribution or production as services offered by one entity, which reduces capital employed and risk for the publisher.

Operations- The process of producing services and products adds value for the company, while delivering the product or service to the customer (Porter, 1985). It includes the digital systems, production lines and workflow of entities (Porter, 1985). In China, publishing companies like Phoenix Publishing & Media Group (PPMG) have their own printing factories, PPMG is the holding company of Jiangsu Phoenix Xinhua Printing (Shao, 2016). 'This is the first publisher in China to build a complete POD production line including presses, post-press machines, data center and production management system' according to Shao (2016, p. 294). These are some of the investments which will be assessed further in the literature review under investment of/in POD technologies.

Output Logistics — Distributing books directly to the customer is important for the supply chain (Porter, 1985). This is part of the service that the publisher would not be directly involved in fulfilling. POD or SRDP is suitable for niche publications because of geographical limitation or segmented markets, which makes it easier to update information through digital technology (Seita, 2017; Laquintano, 2010; Dawson-Cook, 2014). Niche publications are markets that are specific to a certain group of likeminded people with a shared interest, like online poker or gym (Laquintano, 2010; Dawson-Cook, 2014). The niche market can also be seasonal and based on the interest of members involved in a certain shared goal or interest. Niche markets usually involves a group of people who are dispersed around the world or within communities, which means that it would not be ideal to assume that they can all be reached through the same supply chain channel. The *In-store production model* that fulfils onetime orders in store is beneficial for supplying demand for the niche market through printing machines like Xerox or any other digital printing technology (Birkenshaw, 2003; Wilson-Higgins, 2017). However, it is important to consider the cost of getting the book to someone with a shared interest in a topic like online poker whether they are in Australia or South Africa.

Marketing and Sales — Involves all the components of getting the printed book to the customer, which usually requires unique selling point or marketing features to attract the customer (Porter, 1985). The unique feature for POD or SRDP is closely related to the **"long tail"** business strategy, which is great for the publisher's backlist (Anderson, 2006). These are mostly titles that are not a high priority in terms of revenue generation but add value, since they are made available to the book market as low demanded items (Anderson, 2006).

Brooke Warner (2017) states that traditional publishers use POD, once backlist sales reduce to zero or to substantially low orders. This is also ideal for trade publishers, self-publisher and very crucial for academic presses. Since the academic market can be studying the same curriculum worldwide. The University of British Colombia (UBC) Press state how effective POD is to their business in the following quotation (Chang, 2017, p. 14):

> 'Thus, it is evident that UBC Press has presently established a viable strategy for the management of its inventory and print runs, which has also reduced its printing costs and enabled it to take advantage of the "long tail" of many previously out-of-print books in its backlist.'

Chris Anderson's (2006) "long tail" business strategy will help to analyse how hard to locate products can be profitable when sold in small quantities as opposed to huge volumes. Backlist titles can be made available when the customer demands them without incurring the storage cost of keeping slow-moving books. The "long tail" business model is ideal for books that are not on stock through brick-and-mortar retailers and when the backlist titles that are no longer in print (Anderson, 2006; Chang, 2017; Clark & Phillips, 2014).

Services — Encompassing activities that utilise the skills of the human resource team, technological changes and procuring the best services or products, while considering the firms infrastructure is important for trade publishers and academic publishers (Porter, 2009; Chang, 2017). It is important to consider that the manufacturing costs of conventional printing decreases with the number of copies printed, whereas POD unit costs remain consistent despite the number of books printed, therefore **break-even** is possible for conventional printing at a quicker rate and profit margins for publishers are higher with conventional printing (Tzouvaras & Hess, 2001). 'A project's break-even point is the minimum quantity that must be sold to cover the production costs and the author's advance or royalty' according to Clark and Phillips (2014, p. 151). Break-even is the point which the publisher is not making a loss or profit, therefore it will impact the decision making about quantities printed to cover all fixed costs such as marketing, author's advance, royalties, copy editing and cover design cost. If a book is likely to sell less than 1,000 copies for the first print run, it would be best to opt for POD than use offset printing, even if the break-even point is reached quicker when using offset printing (Birkenshaw, 2003, Hall, 2013).

Tzouvaras and Hess (2001) mention that unit cost is not always a determining factor, since there is a point where the unit costs is not a deciding factor in relation to print runs, especially after the first print run. Which makes POD or SRDP suitable for subsequent small orders or reprints after the big first print run (Chang, 2017; Hall, 2013). But it must be considered in relation to the complete supply chain of providing books to the customer. For example, production cost can be expensive when using the *In-store production* model (Birkenshaw, 2003). Even though it might be a wonderful service from the supplier.

When the target market is scattered all over the world, it is important to consider digital technologies and supply chain management that will enable access to book titles and the cost of getting the book to the customer. The *Integrated publishing/production/retailing model* is known as the internet-initiated sale approach, which prompts the in-house printing process and delivering the book to the customer when demanded (Birkenshaw, 2003). This supply chain method becomes an integral means of reaching the dispersed niche market, academic market or the general trade market. One Book E-Print launched in 2014 in Shanghai Book Expo as a service to order books online by using tablets (Shao, 2016). The biggest advantages are that there is no keeping of stock for the publisher and it can result in higher revenue (Birkenshaw, 2003). However, the initiative by One Book E-Print failed to observe the habits of the readers in China, as they offered a limited catalogue which consisted of bestsellers that were already available in bookstores and the older audience did not use tablets to acquire rare Chinese literature (Shao, 2016).

2.3 Utilisation and Availability of Print-On-Demand in Self-Publishing

The self-publishing market has grown to the point that aspiring writers are always emerging (Magadán-Díaz & Rivas-García, 2018). Self-publishing is accessible in multiple platforms and mostly dominated by tech companies that seem to disrupt the traditional publishing business model in all areas of publishing (Healy, 2011; Tsai et al., 2011). Self-publishing has allowed authors to take control of their content dissemination without having to wait for an agent or traditional publisher to grant them access to the publishing world (Dawson-Cook, 2014; Halvorson, 2014). Ken Michaels (2015), states that the trade sector has to acknowledge the increased playing field within the sector as a result of self-published authors, the change in book cycles, increased number of publishers, distribution accessibility, and booksellers must put more

effort to get the attention and detection from customers. The niche market is mostly in the self-publishing sector, niche authors can use POD to reach a wider audience in markets like gym training and online poker playing markets (Laquintano, 2010; Dawson-Cook, 2014). The niche market is usually suitable for self-publishing, since most publishers or booksellers may consider it as an out of place market within their catalogue or offering in bookstores (Tzouvaras & Hess, 2001; Laquintano, 2010; Dawson-Cook, 2014).

Considering the digital technologies, the production processes suggested by Robert Darnton's (1982) communication circuit has changed as authors can write and publish literary works much quicker than ever before (Seita, 2017). Self-publishing is no longer limited to the trade sector or general public, but academics are also self-publishing their monographs or out of the market literature (Wilson-Higgins, 2017). The playing field for POD technology continues to grow beyond other markets. The academic publishing market is discussed in greater detail below.

2.4 Utilisation and Availability of Print-On-Demand in Academic Publishing

Traditional textbooks are recommended less in universities as new players in the market offer educators online course materials at discounted prices (Moro, 2018). Multimedia tools and channels have developed to infiltrate all disciplines in the past 20 to 30 years (Moro, 2018; Hall, 2013). Jessica Moro (2018, p. 417) states that students benefit from digital content 'such as online textbooks, videos, and assessment platforms', since educators 'can better engage their students and help them succeed in their higher education courses.'

In the digital era, consumers, especially academic students in developing countries, determine the format of consumption (Hoang & Nguyen, 2018; Katan et al., 2018; Moro, 2018). This makes it difficult to determine how many textbooks a publisher or bookseller should order. In the United Kingdom (UK), Edmund Chamberlain (2012) investigated Cambridge University's POD initiatives for providing students with affordable printing options in the surge of digital innovations from the likes of Google Books within the institution's libraries. The traditional format of publishing consisted of content that followed a determined production channel, but the digital environment has allowed for specific content to be delivered in multiple formats (Turner, 2014). This is important for inventory control and minimising obsolete stock, especially since about 30% of books in the UK are never sold (Birkenshaw, 2003).

Learning on printed books increases comprehension and retention levels, while ebooks are promoted over print formats even for discourses like Mathematics and Sciences, which require skilled expertise in EPUB3 and hypertext mark-up language (HTML5) to support various devices for complex academic discourse (Hall, 2013; Smith & Bold, 2018, Alexander & Singer, 2017). Some academic students still prefer using textbooks to learn complicated subjects. The biggest threat to academic discourse is in the fact that students are learning differently than ever before, especially for the generation that grew up using tablets, smartphones and electronic readers from the day they were children and up until they enter the higher educational system (Alexander & Singer, 2017; Baron, 2016; Healy, 2011).

The Impact of Print-On-Demand on Academic Books by Suzanne Wilson-Higgins (2017, p. 3) summaries the reasons for studying the impact of POD as follows:

> 'With nearly a decade working with Ingram to establish its UK print-on-demand facility, I felt there ought to be a documented summary of what has happened and the amazing impact that print-on-demand has had on the academic book. Certainly print-on-demand impacted how the academic book is actually made and how it is delivered, and potentially has impacted the very survival of the printed monograph. Not only monographs but also other forms of academic books like custom textbooks, professional training books, grey literature, and book collections have been impacted by print-on-demand. Across all these forms ensuring availability through print-on-demand increased demand while removing infrastructure costs from the delivery of a specialist book to its reader. At its best, by sustaining revenue streams for academic book publishers, print-on-demand offers the printed academic book the potential to flourish alongside the e-book, e-book collection or online learning environment and giving scholars the choice of a printed interface in a digital world.'

The impact on POD is purely about survival of the monograph and other forms of customised literature within the academic domain (Wilson-Higgins 2017). As Greco (2015) mentions that POD is the best option for the publication of monography as librarians, students and academic professionals' perspective is changing and leaning more towards electronical journals for prestige and professional progression. The University of British Columbia (UBC) Press is regarded as the third largest academic press in Canada and uses digital printing to meet demands

of current titles and backlist of more than thousand titles (Chang, 2017). Some of the similarities identified are that the online environment has changed the academic space and the increased use of e-textbooks and journals are taking over the academic publishing space (Morro, 2018; Wilson-Higgins 2017; Greco, 2015). UBC Press experimented outside their main provider called Friesens Corporation, which is in the United State of America (USA), and included companies like BookMobile, Lightning Source and UTP Distribution for smaller reprints of less than 200 copies (Chang, 2017). POD is crucial for academic publishing because it is dependent on individual's learning needs and the academic coordinators determine the best way to teach any subject matter. Therefore, all stakeholders must be reliable and quick in supplying books. In academia, longer lead-times tend to discourage buyers (Chang, 2017). And semester terms are short, therefore students will find alternative ways to get access to a book title.

As Chamberlain (2012) states that students also have options of printing a chapter of a book or use Google Books to read any book available on the platform. Librarians are investing in different delivery methods for their students and they are considering the budget and needs of their students. In the past decade, technological innovation has been an enabling factor for manufacturing customised books and for offering printing solutions from the likes of IBM, Xerox, Adobe, Kodak, Amazon, Ingram and Hewlett Packard (Morro, 2018; Wilson-Higgins 2017; Chamberlain, 2012). Lightning Source's immediate success of POD solutions in the publishing industry is attributed to the earlier collaborative efforts between IBM and Kodak (Wilson-Higgins, 2017). The partnerships with academic institutions have impacted how students learn, especially if access to online bookselling catalogue and software is not a hinderance for the students, libraries and universities (Morro, 2018; Wilson-Higgins, 2017; Chamberlain, 2012). It will be instrumental to observe how technological innovation and printing technology has affected access to printing options for the South African academic market.

2.5 Benefits of Using POD Technology Compared to Offset printing

The new digital technologies for printing permit publishers to use POD to print books to order and to use short-run digital printing (SRDP) for small quantities of minimal of hundreds of copies, according to Haugland (2006). Seita (2017) argues that digitisation does not render print obsolete, but print and digital publishing coexist to mutually add value to the production,

distribution and receiving methods available for smaller publishers. These are the common reasons of why publishers may consider the POD system as opposed to offset printing:

- POD is suitable for printing of less than 500 copies (Tzouvaras & Hess, 2001, Chang, 2017).
- A reduction of inventory stock is expected since it is much easier to print books that are digitised when using POD systems (Hall, 2013; Chang, 2017; Tzouvaras & Hess, 2001).
- The setup costs for POD are minimal as it does not use pressure plates, since it is like a laser printer (Tzouvaras & Hess, 2001; Seita, 2017; Chang, 2017).
- The benefits of POD are that it is cheaper than offset printing, there are no minimum order of books required and it makes it possible for self-published authors to have physical copies of their books (Warner, 2017, Wilson-Higgins, 2017).
- Another factor to consider about printing books in excess of 1,000 units is the storing costs, which must be accounted for, especially if the books are returned by the bookseller because of damages or obsolete information (Tzouvaras & Hess, 2001, Hall, 2013).
- Turnaround time from suppliers is one of the biggest benefits for publishers and booksellers (Gallagher, 2014; Chang, 2017). Inventory ordered through digital printing can take up to three to four weeks, while offset printing can take up to six weeks (Chang, 2017).
- Customisation of literature and academic books that are not suitable for trade publishers is possible (Wilson-Higgins, 2017; Hall, 2013).

2.6 Challenges and the Cost of Using POD Technology compared to Offset Printing

Tzouvaras and Hess (2001), mention that the number of products manufactured based on the print-on-demand (POD) systems continue to grow, however there are no clear indicators on the added value effect for publishers. Some of the drawbacks of POD technology are that publishers are reluctant to print books with too many illustrations for the first print run or subsequent print demands (Lewis, 2012). The variable costs like shipping and custom duties are significantly higher for POD compared to conventional printing, which results in expensive manufacturing costs (Tzouvaras & Hess, 2001; Chang, 2017). Digital printing becomes more expensive. For print run between 500 to 1500 units, it becomes increasingly difficult to ascertain which option is the best between POD and offset printing (Tzouvaras & Hess, 2001). It can be a challenge to quantify the value of using POD, since the unit cost must be factored in relation to getting the book to the end user. For example, UBC Press used BookMobile with higher unit cost than

Lightning Source because it offered better distribution prices than Lightning Source (Chang, 2017). But, UBC Press also factored that they have a great relationship with BookMobile (Chang, 2017). It becomes complicated to quantify the value of POD, since relationships with the suppliers, reliability and distribution cost are some of the components that stakeholders evaluate too.

Geographic restrictions in countries like Australia and China can have limitations for books that can be imported or exported (Shao, 2016; Fabling, 2017). Poor e-commerce infrastructure and limited POD supplier can affect the supply chain of countries outside the USA, Australia and UK (Fabling, 2017; Chang, 2017). The UK and USA seem to have developed POD production lines and systems that are more effective than in other countries. Therefore, countries like Canada and New Zealand are obligated to search outside their own country for POD solutions in order to supply the demand of their readers (Fabling, 2017; Chang, 2017). Importers and exporters open their own distribution and printing factories, so that they can manage quality control of POD, especially for academics and professional publications (Shao, 2017). The benefit of shorter lead time is contested by Fabling (2017, P. 10) in the following quotation:

‘Publishing houses have relocated to Australia, while others are located in the United Kingdom. This decision has affected all the players in the supply chain, especially brick-and-mortar booksellers. Lead-time is longer, and the costs of books have increased due to both administration costs and postage costs.’

Ordering a book via POD seems to be a problem for books that are coming outside the country. New Zealand’s ordeal of having publishing houses that are operating outside their own country is a unique situation. It also makes it difficult for brick-and-mortar bookstores to meet demand and it deters buyers since they must wait longer for new or old titles. Postage and administration cost are a huge deterrent when books are shipped from one country to another. Therefore, booksellers must wait for substantial orders before they can incur shipping and postage cost (Fabling, 2017). The cost of POD technology is a restriction in two folds, one being too expensive to invest in POD technology and the second issue is accessibility in relation to geographical position. The expensive cost is observed as a great challenge and it is discussed further below.

2.6.1 Cost Implications of using POD technology

The expensive cost of POD technology is identified as an issue, especially since most libraries rely on grants from the State and other institutions, although there are other alternative models to enable access to the Espresso Book Machine (EBM) technology (Rapp, 2011; Chamberlain, 2012; Klipp, 2017). Even though, On Demand Books offered libraries the option to purchase or the right to operate the EBM system within libraries as per the agreement reached with the various libraries, it was still expensive (Rapp, 2011). However, the POD technology is creating new opportunities for academic presses and university libraries, especially for students who prefer print formats (Blummer, 2005; Cavanagh, 2015). Adrian Bullock (2012) states that the fact that digital books are treated as a single job when printing, it makes it not economically viable when 500 books of the same title are requested, even though the tipping point may defer from offset printing with different printing jobs.

2.7 Quality of POD Compared to Offset Printing

According to Lewis (2012), there are still drawbacks to POD technologies that fail to match the standard of offset printing, especially in the reproduction of halftones. ‘Halftone process, in printing, a technique of breaking up an image into a series of dots so as to reproduce the full tone range of a photograph or tone art work’ as defined by Encyclopaedia Britannica (*Britannica.com*, n.d). According to Adrian Bullock (2012, p. 147), ‘The term monochrome halftone illustration is generally used to describe a black and white photograph, which has gradations of colour in it’. Nevertheless, some have seen a huge improvement in the quality of digital printing technology in the past decade, especially for black and white text with no images (Chang, 2017; Wilson-Higgins, 2017).

2.8 Helpfulness or Ineffectiveness of POD Technology

POD technology has proven to be highly beneficial for publishers, self-publishers, educators, students and for academics. The Xerox machine can scan, print, punch, fold and bind books in black and white or colour options for consumers in one go (Lewis, 2012; Wilson-Higgins, 2017; Chang, 2017). Although, there is a limitation of page length of 740 for the POD systems offered by Lightning Source Ingram and Lulu, but most monographs qualify to use this digital printing technology (Lewis, 2012; Seita, 2017). Lewis (2012, p. 52) states that ‘The best illustration of

the print-on-demand process can be seen in Xerox's Manual + Book Factory Solution Overview.'

Michael Healy (2011, p. 8) states that 'Conversations that seem to be ostensibly about pricing, copyright, digital rights management, or royalties' are ultimately about the survival of the publishing industry in the disruptive era of new technologies that threaten revenue streams of publishing entities. According to Kotecha (2009), national research networks (NRENs) and information communications technology (ICT) resources within South Africa are failing to make the accessibility of learning materials, such as videos, audios and texts widely available in the academic sector to all students. Therefore, the printed book has more value in countries with poor ICT resources. Language is also a barrier, since most of the digital content is in English (Esposito, 2011; Healy, 2011), or in a language that is unfamiliar to African scholars. Technologies such as POD are increasingly becoming one of the best options, especially when considering the unequal resources in countries like South Africa compared to the resources available in Western civilisation.

Warner (2017) mentions that if booksellers check the number of copies in print for a specific title and if the outcome of the search is zero, it usually raises concerns for the booksellers since they assume that the title is self-published and they are unlikely to invest in the title. 'Critics dismiss the emergence of POD publishers as nothing more than a new version of the vanity presses that have existed for years by preying on people's desires for publication' as declared by Haugland (2006, p. 3). There is an assumption that offset printing is used by traditional publishers and POD is used by self-publishers (Warner, 2017). Bricks and mortar booksellers are reluctant to order books from subsidy publishers, since there are no return policies that are normally guaranteed by traditional publishers and books from subsidy publishers tend to be more expensive, according to Haugland (2006).

2.9 Investment of and in POD Technology

PPMG is the first Chinese publisher to have a complete POD production line with presses, physical stores, digital printing stores, post-press machines, data centres and production management systems (Shao, 2016). This makes it easier to update files, processing printing jobs within the publishing company or for other publishers and for their own supply chain management. The EBM was announced by Darien Library on the 30th of October 2011 as a

printing machine that can produce a bound book in minutes (Rapp, 2011). Albert Greco (2015) states that there were at least 114 university presses in the USA, which professors depend on to publish their monographs, but university libraries have cut their spending on physical texts as they have invested more money on securing access to expensive scholarly journals and POD is instrumental in providing demand for academic presses. The New York based company On Demand Books, manufactured the EBMs, which were subsequently installed in 12 bookstores, and by two academic library institutions— the University of Michigan and the University of Utah (Rapp, 2011). Lewis (2012) declares that POD is useful for backlist which would have normally vanished as the publishers deemed unnecessary to print due to unpredictable demands. Therefore, POD service companies can charge a nominal fee for administration and sales of backlist when demanded. When institutions need a couple of copies of a book title, POD is beneficial for university presses since it reduces inventory costs and shipping (Greco 2015; Wilson-Higgins 2017). Unavailable books within public libraries, academic presses or university libraries could be supplied without problems when demanded, only if they are available through any POD production system from their suppliers. Another aspect of such investments is not in equipment, but by investing with companies that have a complete POD delivery system, such as Lightning Source, One Book E-Print or Amazon (Wilson-Higgins, 2017; Shao, 2016; Chang, 2017).

2.10 Affiliations with POD Service Providers or Entities

Kindle Direct Publishing (KDP) is one of the biggest affiliations for all publishers and self-publishers globally. Create Space merged with KDP to offer POD for paperbacks available on both platforms (*Amazon Kindle Direct Publishing*, n.d.; Morgan, 2016). *AuthorHouse* (n.d.) allows authors to be available on Barnes & Noble, Amazon, Kobo, Ingram and more than 1,000 of other online retailers. One of the advantages of using Kobo according to Rachel Morgan (2016) is that prices are denoted in the South African rand for customers. Another important aspect is to be affiliated with strong media brands within the publishing industry, which is the case for iUniverse since the entity is connected to Authors Guild, and the Society of Journalists and Authors, which offers benefits to authors associated with iUniverse (Haugland, 2006). Due to the high price in distribution costs in South Africa, Morgan (2016) does not recommend self-published authors to list their books on Loot or Takealot.com. On the other hand, Lulu fulfils the orders for content creators and distributes to the buyers and takes a commission, while paying

royalties to the content creators (Haugland, 2006). There are numerous online distributors for indie authors and publishers, and this has made publishing commercially viable. The issue of sustainability is a huge concern for South Africa's book market, particularly when it comes to using POD as a profitable business model and especially when it comes to book distribution (Attwell, 2015; Foligno, 2015; Morgan, 2016).

2.11 Literature Review Conclusion

Digital printing technology has changed the landscape of traditional publishing of using offset or letterpress printing. The literature review has shed some light as to how POD and SRDP technology has impacted the publishing industry by making backlist titles available, without incurring abnormal storage or shipping cost. USA, Australia and the UK seem to enjoy greater success when it comes to the utilisation of POD vendors like Lightning Source and Amazon. However, it has also exposed some weaknesses of access in countries that are considered developed such as Canada and New Zealand. At the same time, business models that add value are those that consider not only the unit cost of printing a book title but that consider the geographical limitations and the expense of getting the book to the customer in relation to the services that POD suppliers offer. This forms a great base as to which business models will create value for inventory and supply chain management for the research study of POD or SRDP in South Africa.

Chapter 3: Research method

This chapter outlines the methodology that will be undertaken in evaluating the use of print-on-demand technology in South Africa. It will also provide the reasons for using the methods that are mentioned in the literature review, as the foundation of utilising some business models. The limitations will also be stated where necessary.

3.1 Research Methodology

Print-on-demand (POD) investigations in South Africa requires extensive research in order to understand the standpoint of trade publishers, booksellers, printing companies, self-publishing providers, academic presses and university libraries in utilising the technology.

The research is geared towards qualitative research, since it is based on the perspective of the interviewed respondents from the respective entities approached to participate in the research study (Kothari, 2004; Creswell, 2003; Newman & Benz, 1998). The literature review established a framework that was followed to investigate POD technologies based on the best methodology between qualitative, quantitative or mixed methodology (Creswell, 2003; Kothari, 2004; Newman & Benz, 1998). Qualitative methodology is the best for engaging the participants without implying any biases or hypotheses based on what has been uncovered from the literature review (Creswell, 2003).

The basis of the research is to investigate how South Africa has adopted POD technology and to ascertain challenges or opportunities in the use of the technology from the participants. The participants were selected based on doing research about companies that use digital printing on Google's search engine, based on guest lecturers who are in the publishing industry who spoke to us about digital technology and from the guidance received from the supervisors. The websites of various participants were studied extensively.

3.2 Research Design

Trade publishers relate the organisations' standpoint regarding the use of offset printing, POD and SRDP. Trade publishers like Pan Macmillan SA, Bookstorm and Jacana Media are compared with the global perspective for using POD technology. The reasons for selecting these trade publishers is to determine the difference of using POD between a large trade publisher like

Pan Macmillan SA and for small to medium size publishers like Bookstorm and Jacana Media. Self-publishing entities that were approached are Self-Publish SA and Rainbird, which is a division of Bookstorm, and the third self-publishing entity that was approached is Reach Publishers. These were chosen as they appeared on the top first page of Google's search engine.

From printing companies, the benefits of different printing methods by the likes of CTP Printers or Novus Print compared to POD or SRDP service printers like 'Print on Demand' or Digital Action will help to analyse the best conditions for using POD, SRDP and letterpress printing options. CTP Printers and Novus Print were selected because they are companies that have multiple investment in printing technologies or media companies. A company called 'Print on Demand' was selected since their primary business is on POD technology and appeared on top of Google's search engine. X Mega Digital was mentioned as being at the forefront of POD technology in South Africa from research participants and supervisors. Paperight enabled POD technology by using a model similar to the EBM technology by enabling printing shops to be booksellers (Attwell, 2015).

For academic presses, Wits University Press (WUP) was selected based on the fact that it is one of the biggest presses in the country and is also easily accessible, while Human Sciences Research Council (HSRC Press) is a small press that is not affiliated with any university. It would be interesting to assess the availability of resources between these two presses. For university libraries, University of Johannesburg (UJ) was selected based on the fact that it is the first university to have a machine that enables POD technology as they acquired the Espresso Book Machine (EBM) in 2012 (IT Web, 2012). North-West University was selected based on the size of the university and location.

In the case of booksellers, it would be interesting to find out which booksellers use POD technologies for bricks and mortar or online retailers like Exclusive Books and Bridge Books. Exclusive Books is selected because it is one of the largest booksellers in South Africa, while Bridge Books is a small powerhouse in Johannesburg. Exclusive Books also serves as a brick-and-mortar and online retailer.

Once the participants were identified, the questions had to be formulated based on the trends and themes identified in the literature review. The best way to conduct the research is to pose the

questions without mentioning the price or quantity factor about using conventional printing compared to digital printing technology. The common theme identified through the literature review is with regards to access and how digital printing technology affects the supply chain system and inventory management for scarce book titles (Porter, 1985; Chang, 2017; Wilson-Higgins, 2017; Anderson, 2006). The term POD or SRDP is contested by various writers in the literature review. The trend also shows that digital printing is used for different outcomes, so the questions are asked without assuming that traditional/true POD or SRDP is utilised for printing of books or monographs, since it can also be used for customised books as well (Chang, 2017; Wilson-Higgins, 2017; Seita, 2017; Gallagher, 2014).

The research followed a standard interview guide sent via email or conducted through telephone conversations, and this depended on the responses given by the respective participants as to their preferred methods of communication. If the interview was done through telephone, the conversation was recorded with the permission of the participant, before the interview took place. However, there are cases were conversations were not recorded because the potential participant expressed no interest in participating when follow-ups were done. But all the participants that are included in the research study have expressed consent to participate via telephone or email responses. Information was gathered by telephone conversation as to ascertain relevancy and to do follow-ups. All potential participants were contacted through email, unless no email address was available. Due to the nature of the research, email or telephone interviews were the best outcome, since there are different participants included in the investigation of POD technology across South Africa. There are different interview guides for the participants and the entities that participated are mentioned below:

1. Trade publishers- Pan Macmillan SA, Jacana Media and Bookstorm.
2. Printing entities- ‘Print on Demand’, X Mega Digital, Digital Action, Paperight and Novus Print.
3. Booksellers- Bridge Books, Van Schaik Bookstores and Exclusive Books.
4. Self-publishing providers- Rainbird by Bookstorm, Self-Publish SA.
5. Academic press- Wits University Press.
6. University Libraries- University of Johannesburg and North-West University.

3.3 Research Instruments

Interview guide for the relevant participants were utilised. The participation information sheet (Annexure 1) and the informed consent form (Annexure 2) were formulated and emailed to the relevant parties. A telephone or mobile phone was utilised if an email interview was not possible and questions regarding confidentiality and anonymity were addressed. Most of the participants answered the emailed interview guide as opposed to a telephone interview. Some participants regarded the interview guide irrelevant to them and answered relevant questions only.

These are the interview guide for the participants (Annexure 3).

3.3.1 Questions for all participants:

1. Does the entity use Print-On-Demand (POD)?
2. In what circumstances does the entity use POD?
3. Which POD technologies does the entity utilise?
4. What are the benefits of using POD technology compared to offset printing?
5. What are the challenges of using POD technology compared to offset printing?
6. What are the cost implications of using POD technology?
7. How is the quality of POD technology compared to offset printing?
8. Why does the entity find POD technology useful or not useful?
9. What POD investments does the entity have?
10. Does the entity have affiliations with POD service providers or entities?
11. Which POD service providers or entities is the entity affiliated with?

3.3.2 Additional question for booksellers:

12. How does POD help customers?

3.3.3 Additional questions for self-publishing providers:

13. What are the views of clients about using POD?
14. What are the views of booksellers for books produced by POD technologies?
15. What POD options does the entity offer to authors?

3.4 Procedure for Data Collection

The research is conducted by analysing websites and contacting some of the parties mentioned in the research design section for participation and contacting them via email or telephone. And then consent form, participation sheet and interview guide were forwarded through email. Most participants opted to answer the emailed interview guide. In some instances, telephone conversations were the source of information as to whether the research is relevant or not to the potential participants. The research from various participants was analysed and themes, trends were compared to the findings of the literature review.

3.5 Data Analysis and Interpretation

The research data is evaluated for similarities and differences across global trends in POD technology. Business concepts that impact the supply chain in publishing from 2.2 of the literature reviewed is utilised to analyse the responses of the participants. As well as to compare what has been observed throughout the literature review. Additionally, any new developments and other readings are included in analysing POD technology across South Africa and globally. Michael Porter's (1985) value chain analysis, and Anderson's (2006) "long tail" business strategy will help to analyse how hard to locate products can be profitable when sold in small quantities as opposed to huge volumes as discussed in section 2.2. Birkenshaw (2003) supply chain model, which correlates with what Porter (1985) and Anderson (2006) have proposed are related in conjunction to how the business models are applicable to the advancement of digital printing technology.

These are the final participants that participated. And they mention if they use POD or not. As this forms the scope of participation and knowledge in using POD technology in book publishing. This is discussed to provide the scope of limitation for the research study and to introduce the participants that will be discussed in the data analysis and interpretation chapters. Participants that opted for anonymity are named as Employee 1, 2,3 and 4. While the other participants expressed to use their names without being anonymous.

Table 1 **Summary of use of POD or SRDP per organisation**

Industry or Organisation	**Source**	**Use of POD Yes/No**	**Use of SRDP Yes/ No**
Trade Publishers			
Pan Macmillan SA	Employee 1	Yes	Yes
Jacana Media	Bridget Impey	Yes	Yes
Bookstorm	Russell Clark	Yes	Yes
Printing Entities			
'Print on Demand'	Tertius Van Eeden	Yes	Yes
X Mega Digital	Glendor Crouch	Yes	Yes
Digital Action	Employee 2	Yes	Yes
Paperight	Arthur Attwell	Yes	No
Novus Print	Employee 3	Yes	Yes
Booksellers			
Bridge Books	Griffin Shea	No	Yes
Van Schaik Bookstores	Melvin Kaabwe	No	No
Exclusive Books	Rob Shortt	No	No
Self-Publishers			
Rainbird	Russell Clark	Yes	Yes
Self-Publish SA	Sally Shaw	No	Yes
Academic Presses			
Wits University Press	Employee 4	Yes	Yes
University Libraries			
University of Johannesburg	Santha Geduld	No	No
North-West University	Louise Vos	No	No

3.6 Limitations of the Study

Some of the entities mentioned in the research design did not agree to participate in the research study, therefore will not be mentioned. The University of Johannesburg does not have the

Espresso Book Machine anymore, therefore they do not use POD technology and found that the research study is irrelevant to them (Geduld, 2020).

3.7 Research Conclusion

The research methodology suitable for data analysis is the qualitative method. The research design includes themes and trends that are relevant to the study of POD technology in South Africa. Therefore, the relevant participants who found the research applicable to them will be discussed further in the data presentation. The research from the literature review will be combined with the academic press and university libraries, so that there can be a comparison between the international and local standard use of POD technology in the academic publishing sector. Bookstores will be limited to Shea's feedback regarding the use of digital technology. South African university libraries do not find POD useful, therefore there will be a limited scope of coverage. The data from participants will be presented by also evaluating websites and existing literature about the use of POD in South Africa and globally.

Chapter 4: Data/ Results Presentation

The participants approached represented trade publishers, printing entities, booksellers, self-publishing providers, academic presses and university libraries. The six groups of categories are used to ascertain how each category of participants perceives print-on-demand (POD) technology within their organisations. Based on preferences, some of the participants opted for anonymity and therefore will be referred by employee number given, but the name of the entity will be used as part of research findings without referring to the participant's name. Firstly, the trade publishers, printing entities, booksellers, self-publishing providers, academic presses and university libraries data is outlined respectively. The data from the academic press and university libraries is combined to form the academic publishing perspective. The raw data was analysed accordingly and compared to what has been uncovered in the literature review. Other sources, such as websites and other sources pertaining to the research investigation are utilised.

4.1 Utilisation and Availability of POD in South Africa

As per *Table 1* in 3.5, out of the people that participated, about 10 out of 16 participants stated that they use true/traditional POD or PTO as defined per the literature review (Gallagher, 2014; Chang, 2017). About 63% of the participants use traditional POD. Whereas 11 out 16 entities use short-run digital printing (SRDP), which is about 69% of the participants. This means that SRDP is used more because of the minimum restriction which are identified by the suppliers that are used by Self-Publish SA and Bridge Books. While Paperight only used true/traditional POD as an enabler of digital printing technology but did not use SRDP.

4.1.1 Trade publishers

The three trade publishers approached were:

1. Pan Macmillan SA
2. Bookstorm and
3. Jacana Media

All three of the participants answered that they utilise POD and SRDP technology for book printing (Clark, 2019; Impey, 2020; Employee 1, 2019). The circumstances in which these publishers use POD is outlined in section 4.2.

4.1.2 Printing Entities

The company 'Print on Demand' uses POD technology (Van Eeden, 2019). Paperight utilised POD systems when it was operational (Attwell, 2020). Digital Action provides POD services to their clients (Employee 2, 2020). X Mega Digital uses POD technology according to Glendor Crouch (2020). Novus Print uses POD technology according to Employee 3 (2020).

4.1.3 Booksellers

Bridge Books does not use POD services, but they use short-run digital printing (SRDP) for publishing children's books, which they do not consider to be POD according to Griffin Shea (2019). The operational manager, Rob Shortt (2020) from Exclusive Books said the study is not applicable to them, as they do not use POD technology at all. Van Schaik Bookstores does not use POD in any way according to Melvin Kaabwe (2020).

4.1.4 Self-publishing Providers

Rainbird by Bookstorm recommends and utilises POD and SRDP technology for their customers according to Russell Clark (2019). Sally Shaw (2019), who operates Self-Publish SA uses SRDP.

4.1.5 Academic Publishing

According to Employee 4 (2019), WUP does use POD and SRDP technology. According to Louise Vos (2019), the study is not applicable to North-West University, therefore the library does not use POD technology at all. The University of Johannesburg does not have the Espresso Book Machine (EBM) anymore according to Santha Geduld (2020), so the research study is no longer relevant to them. However, it is important to determine the challenges that made it impossible for the EBM system not to thrive in the South African academic environment.

4.2 Circumstances for using POD in South Africa

4.2.1 Trade Publishers

Two of the participants use POD for print runs of 500 copies or less (Employee 1, 2019; Clark, 2019). POD is used for the following circumstances (Clark, 2019; Impey, 2019; Employee 1, 2019):

- Reprints or top-up orders of books
- Short-run digital printing of books
- Book proofs and
- For custom publications that are not commercially sold.
- Backlist that are no longer available in stores.

Jacana Media is putting together a whole catalogue of books that will be available as print-on-demand titles according to Bridget Impey (2020). Bookstorm generally uses digital printing for short-run digital printing (SRDP) of books that they do not sell commercially (Clark, 2019). Jacana Media started to publish their trade list in 2002 and a lot of their book titles that they have published still have a place in the publishing world, but it does not make commercial sense to do proper print runs for titles that were published more than a decade ago (Impey, 2020). Bookstorm do top-up orders or reprints by using POD or SRDP, for print runs of less than 500 copies of a book title (Clark, 2019). For small orders ranging from 1- 300 or maybe 400, Jacana Media uses POD (Impey, 2020). Pan Macmillan SA uses POD for printing proofs and reprints of less than 500 copies (Employee 1, 2019). This shows that POD is crucial for internal and external use for assessing the completeness of the books before trade publishers can invest on large print runs. Jacana Media's catalogue of the POD list consists of books that are not currently available in their warehouse at all (Impey, 2020). The printing of the books included on the catalogue will be more expensive than the initial retail price (Impey, 2020). Which means it will cost the customer more money to get the book.

4.2.2 Printing Entities

According to Tertius Van Eeden (2019), the director of 'Print on Demand' states that their core business is 100% based on POD services. Paperight operated from 2010 to 2014 according to Arthur Attwell (2020), Paperight was a primarily enabler of POD technology. It operated more like a network system that allowed publishers to enlist their catalogue on their platform for books on demand for printing shops nationwide. Which is like the system that Chamberlain (2012) discussed for Cambridge's university libraries. Digital Action provides POD for books, for printing catalogues and for other formats, such as business cards and brochures (Employee 2, 2020). The primary objective of Paperight was to make POD much cheaper and widely accessible in South Africa (Attwell, 2020). X Mega Digital, services the publishing industry and their main business is book printing according to Glendor Crouch (2020). Essentially, Paperight used print-on-demand through copy shops that connected to the internet as the customers waited for their books to be printed (Attwell, 2020). Novus Print uses POD technology under limited conditions, as minimum quantities of batches are required in order to make it economically viable for them (Employee 3, 2020). As much as they can fulfil orders of any amount. They require a minimum number of books to be printed through their digital production line in order to remain profitable.

4.2.3 Booksellers

Bridge Books does not use POD but have started to print children's books by using digital printing services, which Griffin Shea (2019) does not consider as POD as such, since they print a small batch from the supplier. However, Bridge Books' self-published authors sometimes use POD from mostly overseas providers, which makes delivery costs exorbitant according to Shea (2019). Which means that the cost is usually passed to the buyer. The research study is not applicable to Exclusive Books (Shortt, 2020). Melvin Kaabwe (2020) states that Van Schaik Bookstores does not use any POD printing suppliers as they have developed a well-honed supply chain system to service campuses all over the country. And the great relationships with suppliers and publishers over the 100 years of supplying books by Van Schaik Bookstores is a result of an effective logistic system (Kaabwe, 2020).

4.2.4 Self-publishing Providers

Self-Publish SA produces books for their clients by printing small batches (Shaw, 2019). Which means that their supplier requires them to order a minimum amount to qualify to print books through them. Rainbird uses short-run digital printing for their clients for printing custom publications according to Clark (2019). As mentioned in the literature review that customisation is one of the benefits of using POD (Seita, 2017, Laquintano, 2010; Dawson-Cook, 2014). This is for clients that take previously published books and customise them to their companies needs or brand identity. Shaw (2019) states that their clients may print a batch of 50 copies and then another 50, but they never print less than 50 for their clients. This is in line with SRDP, which allows self-publishers to print books in small quantities (Hall, 2013; Chang, 2017; Warner, 2017).

4.2.5 Academic Publishing

In 2014 WUP introduced a revised workflow which allowed them to use POD by 2018 (Employee 4, 2019). Using POD technology is applicable for printing WUP's titles in the following territories: Canada, USA and UK. As Chang (2017) mentioned that UK, Australia and USA have a stronger true POD and SRDP supply chain system than Canada, as the University of British Colombia (UBC) Press uses SRDP suppliers that are situated in the USA. Whereas in South Africa there are no affordable POD companies available for utilising POD, WUP uses SRDP in South Africa as opposed to POD according to Employee 4 (2019). Chang (2017) states that multiple suppliers are used to fulfil orders, since UBC Press can be printing multiple titles at once. According to Employee 4 (2019), POD is limited and not applicable for art books or heavily designed graphic treatments that require colour matching print work. Employee 4 (2019) states that 'The Production process has been set up to produce POD compliant titles and hence POD compliant files.' This makes is easier to upload files to the POD/PTO suppliers like Lightning Source, which UBC Press and WUP utilise to reach other countries that they cannot directly access (Chang, 2017; Employee 4, 2019). As Greco (2015) and Wilson-Higgins (2017) mention that POD/PTO is crucial for academic presses and for university libraries. However, it is not instrumental for academic libraries in South Africa (Vos, 2019; Geduld, 2020).

4.3 Technologies, Investment and Affiliated POD Suppliers Utilised

The question regarding the use of POD technology, investment and affiliated suppliers are integrated in order to understand how trade publishers, printing companies, booksellers, self-publishers and the academic publishing sector uses POD technology or investments.

Table 2 **Summary of Entities with Affiliations or Investment in POD Service Providers or Entities**

Industry or Organisation	**Source**	**Affiliation/ Investments with POD/SRDP Providers Yes/No**	**Name of Providers or Entities**
Trade Publishers			
Pan Macmillan SA	Employee 1	Yes	Lightning Source Ingram Bidvest Data
Jacana Media	Bridget Impey	Yes	'Print on Demand' Digital Action X Mega Digital
Bookstorm	Russell Clark	Yes	Amazon Lightning Source Ingram
Printing Entities			
'Print on Demand'	Tertius Van Eeden	Yes	Xerox
X Mega Digital	Glendor Crouch	Yes	Kodak USA and Konica Minolta
Digital Action	Employee 2	Yes	Kodak USA
Paperight	Arthur Attwell	No	None

Novus Print	Employee 3	Yes	Cannon, Ricoh and Kodak USA
Booksellers			
Bridge Books	Griffin Shea	Yes	Britespark
Van Schaik Bookstores	Melvin Kaabwe	No	None
Exclusive Books	Rob Shortt	No	None
Self-Publishers			
Rainbird	Russell Clark	Yes	Amazon Lightning Source Ingram
Self-Publish SA	Sally Shaw	Yes	Bidvest Data
Academic Presses			
Wits University Press	Employee 4	Yes	Lightning Source Ingram
University Libraries			
University of Johannesburg	Geduld Santha	No	Ceased using the EBM when contract ended and it was serviced by Konica Minolta
North-West University	Louise Vos	No	None

Out of all the participants, trade publishers, academic presses and self-publishers are affiliated with Lightning Source Ingram and Bidvest Data as the most popular POD service providers (Clark, 2019; Employee 1, 2019; Employee 4, 2019; Shaw, 2019). While the only bookstore that found POD service providers useful is Bridge Books (Shea, 2019). Bridge Books uses Britespark for SRDP of children's books. This is great for customisation. According to the data in *Table 2*, about 69% of the participants are affiliated with companies that provide POD printing technology or investments. Three out of five printing entities use Kodak as their supplier for POD technology and these investments enable them to service the South African publishing market. Which means 60% of the printing participants use Kodak as their preferred supplier.

4.3.1 Affiliated Service Providers and Investments for Trade Publishers and Self-Publishing Providers

Traditional POD services are outsourced by Bookstorm and Rainbird from a USA based printing companies like Amazon and Lightning Source, while SRDP can be done locally or internationally (Clark, 2019). Employee 1 (2019) from Pan Macmillan SA utilise services from Lightning Source and Bidvest Data for POD or SRDP orders. Jacana Media outsource POD services from Digital Action, X Mega Digital and 'Print on Demand' (Impey, 2020). Pan Macmillan SA, Jacana Media, Bookstorm, Rainbird and Self-Publish SA do not have any interest or investments in POD machinery or equity stake in any POD entities (Clark, 2019; Employee 1, 2019, Impey, 2020, Shaw, 2019).

4.3.2 Printing Entities investment in POD Technology

The company 'Print on Demand' uses ink jet digital web technology provided by Xerox (Van Eeden, 2019). Paperight granted access to any outlet connected to the internet and a printer in order to retrieve the catalogue available on their website, as and when the copy shop loads money to their respective accounts as per customer order (Attwell, 2020).

Digital Action has the following investments or technology to enable digital printing (Employee 2, 2020):

- 3 x Black and white- Digital presses
- 3 x Colour- Digital presses

X Mega Digital has the following investments or technology to enable digital printing (Crouch, 2020):

- 1 x Ink jet roll fed,
- 1 x Ink jet sheet fed,
- 2 x Toner-based colour machines,
- 3 x Toner-based black and white machines.

Novus Print, investments or technology to enable digital printing are as follows (Employee 3, 2020):

- 2 x Cut Sheet Toner Digital
- 1 x Ink jet digital
- 1 x Man Roland fold line
- 1 x Kolbus book block binder

4.3.3 Academic Publishing

The WUP workflow for POD is XML driven (Employee 4, 2019). The document type definition (DTD) specifies limitation for POD in terms of trim size, page bleeds and crop markings, and then the POD files are produced and parsed, as states Employee 4 (2019). Therefore, it is important to consider SRDP and POD workflow from the likes of Lightning Source. However, traditional POD has limitation and might not always be suitable, which means that SRDP will be crucial for complicated printing jobs (Chang, 2017; Wilson-Higgins, 2017). WUP adheres to Lightning Source Ingram requirements, since it is their main source of POD that they use for international customers (Employee 4, 2019). According to Geduld (2020), UJ leased the Espresso Book Machine (EBM) from Konica Minolta until their contract ended.

4.4 Benefits, Challenges, Cost Implications and Usefulness of using POD Technology

The benefits, challenges, cost implications and usefulness of using POD or SRDP compared to offset or letterpress printing is combined because of the similarities in themes and trends given by participants. The best way to decode the information is through making a table that will highlight important themes from all participants. Majority of the participants mentioned benefits and challenges as something that included the usefulness and cost implications of using digital printing compared to offset printing. Therefore, the issues of cost will be covered in this section too.

Table 3 **Benefits and Challenges of using digital technology compared to offset printing**

Benefits	**Challenges**
Turnaround Time All the trade publishers and Employee 4 (2019) from WUP identified that the speedily turnaround time is a huge benefit for using POD technology compared to offset printing, especially for popular book titles (Employee 1, 2019; Clark, 2019; Impey, 2020; Employee 4, 2019). The printing entities also agree that this is a huge benefit that they provide for their clients, as it takes half the time to deliver books printed through digital printing as opposed to offset printing (Employee 2, 2020; Van Eeden, 2019; Crouch, 2020; Employee 3, 2020).	**Longer Operational hours** The quick turnaround time in POD factories requires 24 hours operations, which might not always be the case for offset printers (Crouch, 2020). And as a result, the 'Digital Printing papers and machines has to be in area where the temperatures are regulated' states Glendor Crouch (2020). Handling multiple smaller jobs of about 30 to 40 jobs that need to be delivered in a day for POD as opposed to dealing with 10 to 20 printing jobs that can be delivered within two weeks for offset printing can be challenging according to Crouch (2020).
Easy to update or change information No Printing plates are required since printing jobs are printed directly off customers PDF's (Crouch, 2020). Text and images can be quickly edited or changed, guaranteeing that all the information is current and correct (Employee 3, 2020). Therefore, there is no need to store pressure plates as files are digitally archived (Crouch, 2020).	**Compromise in the in-house style** The compliance to a POD service provider's file requirement can sometimes compromise the in-house style and that might require the publisher to work harder in order to maintain the substance and style of the publishing house (Employee 4, 2020).

Access for Niche and Customisation Being able to print one copy to a thousand books is a huge advantage for the niche market and for personalisation of books and covers for children's books or academic books (Van Eeden, 2019; Crouch, 2020; Shea, 2019; Employee 3, 2020, Clark, 2019). It is a huge advantage for niche publications that would not be taken by trade publishers. Which is seen as an advantage for self-publishing providers like Rainbird and Self-Publish SA (Clark, 2019; Shaw, 2019). It is an entry point for museums, academic presses and self-publishers who want to customise or personalise their books.	**Limited Cover Options and paper stocks** There are limitations for cover designs when using POD option, since there are no spot ultra-violet (UV) finishes or embosses due to the complex nature of the technology or expensive costs associated with POD technology, and self-publishers are often forced to use limited paper stocks and size options (Clark, 2019). Another challenge for POD is that there are more paper stock options available for using offset printing than there is for POD (Crouch, 2020). Therefore, the niche market is limited in what they can do. Some paper stocks must be coated according to Crouch (2020).
Reduction in warehousing or transportation No warehousing required when using digital printing, whereas traditional publishers order 1,000 copies of books when they only require a few hundred (Employee 3, 2020; Employee 4, 2019, Van Eeden, 2019, Impey, 2020, Clark, 2019; Employee 1, 2019). Publishers can avoid transportation costs with storage facilities as books can go directly to customers or booksellers (Employee 3, 2020). Papers and consumables for printing companies can be purchased when needed	**Metadata management and procurement of skilled workers** There is too much work involved in setting up the files to print only one copy of a book when using POD (Clark, 2019; Employee 4, 2019). There are setup costs for using POD technology that need to be considered for output process and for compliance (Employee 4, 2019). However, Attwell (2020) doubts that South African publishers will embrace the opportunity as educational publishers did not embrace Paperight, since they viewed it as an extreme solution. Employee 3 (2020)

(Crouch, 2020). This is ideal for POD factories with multiple jobs with short-lead time.	mentions that publishers are not receptive to POD.
Flexibility in inventory management Offset printing can result in overstocking books, which can result in write-offs of inventory at the end of the financial year, due to poor sales (Clark, 2019; Employee 1, 2019; Employee 3, 2020; Employee 4, 2019; Impey, 2020; Shea, 2019). POD or SRDP is suitable for the trade and academic market and for backlist titles (Employee 3, 2020; Employee 4, 2019; Impey, 2020, Clark, 2019; Employee 1, 2019). Reprints are managed better due to digital printing technology (Employee 3, 2020; Employee 4, 2019, Employee 1, 2019). This helps production teams to make changes easily and they can make updates to the files.	**High maintenance cost and failure rate** 'POD equipment is built largely on electronics and plastic, as opposed to Litho, heavy metal, and as such, failure rate is higher' according to Employee 3 (2020). At the same time, it is expensive to keep the printers up to date with the latest software (Employee 2, 2020; Van Eeden, 2019). Technicians are called at the expense of the company into the country from overseas, because of limited POD equipment in the country and as a result there are few people with the required knowledge (Employee 3, 2020; Crouch, 2020; Van Eeden, 2019; Employee 2, 2020).
Cash flow management Trade publishers' state that POD provides good pricing for printing books in small numbers (Employee 1, 2019; Impey, 2020; Clark, 2019). As Attwell (2020) mentions that it is all about managing cash flow when it comes to using POD technology compared to	**Not profitable and negatively perceived** A crucial aspect mentioned by Russell Clark (2019) is with regards to the tipping point where SRDP or POD becomes more expensive for print runs in excess of 1,000 units when compared to offset printing. This means that it would not be ideal to use POD

offset printing. There is less risk with SRDP (Shea, 2019). Impey (2020) states that offset printing gives them better unit prices, but POD allows them to print smaller numbers and Jacana Media does not have to sit with 3,000 copies of books that cannot be sold. If anyone has the money and the confidence to sell 1,000 copies of a book title, they will rather use offset printing than POD since it is vastly cheaper per unit cost (Attwell, 2020, Employee 1, 2019; Clark, 2019; Impey, 2020). They could afford to do that six years ago but not in today's current book economy (Impey, 2020).	or SRDP for a book that sells 1,000 or 3,000 copies within a year because publishers would make more profit if they used offset printing (Employee 1, 2019; Impey, 2020; Attwell, 2020; Clark, 2020). The unpredictable market can make publishers miss opportunities of using offset printing. It requires training and knowledge in order to remain profitability. Management must be smart when it comes to assessing warehousing cost, shipping cost and the benefits and the challenge of weighing all variables while thinking of the complete supply chain system (Porter, 1985; Seita, 2017; Clark, 2019; Employee 4, 2019).

Offset or letterpress is often referred as 'litho' or lithographic printing in South Africa (Hall, 2013; Thompson, 2005). There will always be a difference with POD and offset printing as it is like comparing apples and pears, since 300 copies printed by POD and 3,000 copies printed using offset printing by companies like ABC Press or Novus Print are vastly different (Impey, 2020). Even though it is cheaper to print per unit with short-run digital printing, it impacts on the bottom line for Pan Macmillan SA (Employee 1, 2019), as unit cost per printing job often stays the same for POD according to Clark (2019). Bridget Impey (2020) states that the unit price would be more if they are printing 3,000 copies using POD, but overall, Jacana Media would not

incur warehousing costs when using POD. For offset printing, the biggest advantage for costing is the economy of scale with the reduction of cost price for more quantities printed, whereas with POD the cost price remains the same, irrespective of the number of quantities printed (Clark, 2019, Impey, 2020, Employee 1, 2019). One of the advantages for using POD is for international distribution, since the printing can be done for affordable prices in the USA for the North American book market and across the world for book sales of Bookstorm's titles, according to Clark (2019). But the South African booksellers that participated do not currently use POD service providers (Kaabwe 2020; Shea, 2019; Shortt, 2020).

However, Kaabwe (2020) noted that there are titles which could have benefited from POD in the past, such as Oxford University Press SA's (OUPA) title called '*Introduction to Business Management*', the '*SAICA Student Handbook Vol 2',* and in the year 2020, the title '*Understanding Macro Economics*' published by Van Schaik Publishers would have benefited from POD. These are missed opportunities that academic publishers and booksellers could have capitalised on for additional revenue by using POD or SRDP *In-store production* system model (Blummer, 2005; Cavanagh, 2015; Birkenshaw, 2003). Academic publishers and booksellers are printing less books due to the unpredictable demand that both publishers and booksellers have experienced. At the same time, digital printing is very expensive in South Africa for the printing factories.

The cost on digital toner flat sheet is normally hugely negotiable, although it is still immensely expensive in South African market according to Crouch (2020). Even though SRDP is less expensive than traditional digital printing, it is more expensive than offset printing (Van Eeden, 2019). The cost on ink jet machines are extremely high; the entry level ink jet machine costs about R 15 million, while toner cut sheet machines ranges from R 800 K to R 5 million (Crouch, 2020). Cost centres of traditional publisher's expenses such as warehousing, stock handling and promotion work, usually disappear with true print-on-demand, but the production cost increases drastically (Attwell, 2020). This is the same scenario that Fabling (2017) stated about the high administration cost and postage fees in New Zealand. In South Africa, the investment cost is still expensive as demand is relatively low and the exchange rate is a huge factor to costing as states, Employee 3 (2020) from Novus Print. The production costs can be 5 to 10 times higher than for traditional ways of printing books and that changes how businesses are financed (Attwell, 2020).

Glendor Crouch (2020) states that ‘Digital printing machines can be negotiated on rental contracts and are charged out on click rates, whereas finishing equipment must be bought outright, finishing department comes at a huge cost’. POD technology has introduced a lot of uncertainty and confusion for publishers according to Attwell (2020).

The culture of photocopying books in South Africa and the inability to gain access to ebooks, affordable internet coverage and high production costs of books inspired Arthur Attwell (2015) to start Paperight. Distribution is seen as a huge problem for the book market in South Africa (Attwell, 2015; Gaigher et al., 2014; Foligno, 2015). According to Attwell (2020), it will be a game changer when South Africa starts to have its own print-on-demand factories through companies like Amazon or Lightning Source. The dominance of Exclusive Books and CNA as retailers that get discounts between 45-55% is identified as a huge disadvantage in terms of affordability according to Silvia Foligno (2015). Even though Attwell (2015) argues that the future of books will be in smartphones, Attwell (2015) acknowledges that there are format limitations and the issue of affordability for most students in Africa, while in South Africa access is limited to major cities. The slow internet connection in South Africa is obstructing the distribution of ebooks (Foligno, 2015; Gaigher et al., 2014). Attwell (2015) argues that publishers could capitalise by partnering with copy shops with internet connection that students usually utilise for making illegal copies by licencing the rights to print portions of the book or the whole book of the catalogues of libraries or of publishers at affordable prices. Foligno (2015) states that the book industry in South Africa is still in the developmental phase compared to the US and UK book market. The solution suggested by Attwell (2015) allowed publishers to reach the market that cannot afford to buy the fancy paperback or hardback versions whilst making substantial profit margins by saving on shipping costs and production costs. Unfortunately, Paperight closed in December 2014 due to financial constraints (Attwell, 2015).

4.5 Quality of POD Technology compared to Offset Printing

4.5.1 Colour Work compromised for Trade Publishers, Academic Presses and Self-publishing Providers

The noticeable difference for printing with POD or SRDP technology compared to offset printing is in the quality, since Bookstorm, Jacana Media and Pan Macmillan SA have all stated that colour printing is usually difficult to do due to colour matching, price and quality in POD technology compared to offset printing (Clark, 2019; Impey, 2020; Employee 1, 2019). According to Employee 4 (2019) from WUP, colour for jackets and internal text remains an issue. However, Sally Shaw (2019) from Self-Publish SA, states that the quality of the books printed by Bidvest Data is of a high standard. In the past ten years, binding technologies have improved and that has helped with the acceptance of POD technology in society (Employee 4, 2019). 'Quality left a lot to be desired in the past, but you would need a skilled eye to tell if a book was printed POD these days' states Russell Clark (2019). Employee 4 (2019) considers the quality for text only publications to be negligible, as consumers are now very familiar with books produced by POD technology. As a result, colour sections in some books are converted to black and white when using POD in order to mitigate the issue of quality (Clark, 2019). But the difference is hardly noticeable for booksellers.

The sample prints that Bridge Books has received from Britespark are of great quality so far (Shea, 2019). All trade publishers agreed that the technology has vastly improved in the past few years compared to the beginning of implementing POD technology (Clark, 2019; Employee 1, 2019, Impey, 2020). Clark (2019) states that the production quality for POD is nearly as good as offset printing and suitable for trade publishing and for self-publishing. According to Impey (2020), the quality of POD is remarkable, although not necessarily great for colour work, but for normal text publications done in black and white, it is perfectly acceptable. It is rather an insignificant issue for most standard use if not disregarded (Employee 4, 2019). 'Without being cynical most consumers would not be able to tell the difference between litho, digital or POD printed books' states Employee 4 (2019).

4.5.2 Printing Entities perspective on Quality

‘These days I cannot tell the difference for black and white books between litho printing and POD’ states Arthur Attwell (2020). Employee 2 (2020) states that ‘With today’s machinery it is as good as offset printing’. The ‘Quality of digital printing is improving every year’ states Glendor Crouch (2020). Certainly, ten years ago Attwell (2020) could tell the difference because of the quality of the toner and the ink used was a clear indication of POD technology. ‘Colour management software allows digital to be very close to litho, that being said, the toner-based machines are closer to quality than Ink Jet presses’ according to Crouch (2020). The resolution of the machines has gotten better over the years according to Attwell (2020). The huge difference between POD technology and offset printing is in the paper used, as it has limited paper stock, although that has vastly improved now (Attwell, 2020). This can also affect the quality of how colour books look. The analogy of apples and oranges is utilised to distinguish the visible difference for POD technology compared to offset printing by Van Eeden (2019). The paper stock for most of the digital printers is limited and the problem was with the bulky paper for novels, and that has improved (Attwell, 2020). Therefore, there are limited options for certain niche work that might require different paper stock that is not available from the suppliers. While paper is still expensive and needs to be bought in high quantities in order to enjoy the advantage of discounts (Attwell, 2020; Crouch, 2020). Tertius Van Eeden (2019) states that ‘POD technology is business application driven’, while offset technology is ‘photobook quality’.

The other issue is the cover finishes that limits publishers printing with POD, especially in how fancy publishers can get with their covers, since in print-on-demand, publishers are limited to a gloss finish or matt laminated or UV vanish (Attwell, 2020). Which is the same problem that trade publishers are experiencing.

Employee 3 (2020) from Novus Print illustrates the quality between offset printing and POD in the following comprehensive explanation and example:

> “There are two POD technologies, Toner and Inkjet technologies. Toner digital is able to print at a higher resolution, i.e.: 600 x 600 dpi for colour for halftones and 1200 x 1200 dpi for Line art (B/W text), while most Inkjet technologies cannot

deliver a true 1200 x 1200 dpi resolution, resulting in text not being as crisp as offset. See example below:"

Figure 2

Litho - 1200 x 1200 dpi

Inkjet 600 x 600 dpi

4.6 POD's Impact on Customers

4.6.1 Booksellers and Self-Publishing Providers

According to Griffin Shea (2019), Bridge Books is yet to find out about the direct impact that POD will have on their customers, since they just started using a POD service provider. Booksellers have no negative reports from customers about the impact of POD produced books. Most of the self-published clients that Rainbird acquires often have no idea about what type of printing the self-publishing provider uses for them (Clark, 2019). Sally Shaw (2019) states that clients are often very glad to print small quantities when using Self-Publish SA expertise and have no complains. Russell Clark (2019) states that self-publishing clients are under the impression that small-run digital printing is POD. The book reading market in South Africa is used to the quality of digitally printed books and the differences in different digital technologies is hardly noticeable to them.

4.7 The views of Booksellers for Books Produced by POD Technologies

4.7.1 Self-Publishing Providers

Rainbird has noticed an increasing trend by big publishing houses that use POD for their titles, such as Penguin Random House that printed the latest Malcolm Gladwell book on POD, according to Clark (2019). Self-Publish SA is unaware of the impression of the booksellers for titles produced by them (Shaw, 2019). 'In the past, we've had booksellers complaining about

poorly printed books on thin paper with bad covers, but POD technology has come along so far that very few booksellers would even know how books are printed' states Clark (2019). Clark (2019) could tell that the copy he bought was printed using POD by the quality of the cover, as it was printed on thinner paper stock, while the other copy of Malcolm Gladwell's book from Exclusive Book was printed through offset printing. And Clark (2019) mentions that Penguin Random House might have simultaneously used POD and offset printing in order to keep up with the supply of inventory for the book title released in October 2019.

4.8 POD Options Offered to Authors

4.8.1 Self-Publishing Providers

Bookstorm reprints book titles that were once on the trade market as custom titles under their self-publishing division Rainbird, for quantities of about 300 or 500 copies for a few couple of their clients (Clark, 2019). Self-Publish SA prints for production clients and arrange print quotes for walk-in authors who have their books ready to print, states Sally Shaw (2019). Rainbird offers short-run digital printing to self-published authors and to corporate or custom clients, according to Russell Clark (2019).

4.9 Final Presentation Findings

The utilisation and availability of POD and SRDP is alive and well in South Africa. However, the views about what POD means is hugely contested by the participants. All the trade publishers, self-publishing providers and the academic press have adequate POD service providers and printing entities that they use to meet the needs of their end users. A mixture of digital printing methods is used by trade publishers for internal and external use in order to ensure quality control. The printing entities are very active in offering services for various markets, while struggling with expensive maintenance cost and operating cost. Most printing companies and publishers are expanding their services to cater for multiple markets. Workflow is a huge issue to consider because participants must account for the POD service providers' requirements, SRDP minimum quantity requirements and the tipping point so that they do not miss using offset printing in an unpredictable publishing industry. At the same time, participants are exploring all their options to create value for the end user, while remaining profitable and sustainable.

Chapter 5: Data Analysis

5.1 Defining Print-on-demand and Changes in Trade Publishing

Print-on-demand (POD) is realised in two contextual viewpoints by the participants who responded to the research study. These are the two definitions outlined from the research:

1. **Print-on-demand**— in book publishing is primarily outlined by the printing of a book through a digital printing machine without preparing pressure plates, which is printed on the request of the reader or buyer as opposed to the publisher (Attwell, 2020; Clark, 2019; Shea, 2019; Employee 4, 2019). As described in the literature review, print to order (PTO) or true POD is the printing of a single book from a digital system that can be occupied in a library, bookstore or printing plant when the book title is demanded by the end user (Chang, 2017; Gallagher, 2014). The files are stored in a digital format and when someone orders a book, companies like Lightning Source Ingram or Amazon would send the ordered book directly to the buyer or to the bookseller (Haugland, 2006; Employee 4, 2019; Wilson-Higgins, 2017).
2. **Print-on-demand** — is also delineated by the trade publisher, academic press or self-publisher through the secondary means of small-run digital printing (SRDP), which some participants do not deem as authentic POD as the bookseller or buyer does not necessarily drive the ordering process (Attwell, 2020; Clark, 2019; Shea, 2019; Shaw, 2019; Employee 4, 2019). As discussed in the literature review, SRDP is printing of small quantities of books using ink jet or toner-based printers to print books of more than two, but less than 500 or 1,000 copies, which is depended on the tipping point between offset printing and digital printing method for the publishers (Clark, 2019, Hall, 2013; Chang, 2017; Warner, 2017).

The first definition gives rise to what Attwell (2020) and Gallagher (2014) define as ‘true print-on-demand’, while SRDP is interpreted as print-on-demand by some industry experts by the virtue of using digital printing technology as opposed to using offset or letterpress printing machines (Lewis, 2012; Haugland, 2006; Seita, 2017, Impey, 2020). The process of digitisation is noted in the literature review as part of enabling digital printing through PDF ready files (Hall,

2013; Seita, 2017; Warner, 2017). The tipping point is important since ensuring that the right printing method is utilised for getting the books to the customers without keeping unsold books in storage or wasting money that could be invested in other publications is a matter of survival. All three trade publishers related to the added pressure to order the right number of books from the onset, especially without losing the added benefit of using offset printing if it is ideal for a certain book title (Clark, 2019; Employee 1, 2019; Impey, 2020). Therefore, POD is applicable in the first definition of POD and through the secondary definition of SRDP for the South African trade publishers. However, the publishing industry has become unpredictable and customers habits are not easily recognised (Shao, 2016; Fabling; 2017).

The digital world has given trade publishers like Bookstorm and Pan Macmillan SA the means to compete locally and internationally (Clark, 2019; Employee 1, 2019). The use of offset printing when compared to POD or SRDP is seen by all trade publishers as a way to mitigate the risk of ordering too much inventory, especially since the publishing industry has changed in the past decade. The participants interviewed agreed that SRDP has been instrumental for making their publications available (Clark, 2019; Employee 1, 2019; Impey, 2020). While 'true POD' is not clearly encapsulated in the South African publishing market. As other participants believe that 'true POD' does not really exist in South Africa, especially when considering the negative connotation that POD has received from academic publishers (Attwell, 2020; Shea, 2019; Clark, 2019; Employee 3, 2020). The expressed concern from the academic press consulted is about affordable POD suppliers in South Africa, therefore, they only use SRDP for the local market and POD internationally (Employee 4, 2019). The quantities that need to be printed in the production line for printing factories must be substantial for them to remain profitable (Employee 3, 2020; Crouch, 2020). However, companies like 'Print on Demand' have seen a gap in the market and aim to meet customer's expectations by offering true print-on-demand through their digital web printing solutions that services online retailers like Takealot.com and the academic market among other targeted markets (Van Eeden, 2019). The disconnect between the printing and publishing sector is something that has been observed by the likes of Shao (2016) from studying the Chinese offering of POD service providers and publishers. The printing and publishing companies could offer a plausible business model if they could work together. However, competition and segregation of functions could be creating contrasting perceptions, and opposition among the printing and publishing industry in the current digital age.

The apparent contradictions and debates about the definition of POD shows that there is a disconnect with regards to the technologies used to print books. The impact of business models that create value for the stakeholders in the publishing industry will be crucial for generating reasonable profit margins and sustainability for the uptake of digital printing solutions. It is important to assess how the different printing technologies impact the supply chain for the South African book market.

5.2 Business Concept that Impact the Supply Chain in South African Publishing

In assessing the uptake of POD, SRDP and offset printing as methods that offer the stakeholders viable options, it is important to take into consideration business concepts that impact the supply chain of books as an integrated system that aims to derive value and sustainability. *Figure 1* relating to Porter's (1985) supply chain model is increasingly important in assessing how the South African book market relates to the global market. The "long tail" method by Anderson (2006) will also be considered in respect to how it impacts the publishing industry in South Africa. Birkenshaw's (2003) supply chain for POD is relatable to other models and important to examining the findings about the impact of digital printing in South Africa.

Inbound Logistics— the printing companies with production lines for SRDP or POD printing provide the primary services of delivering the book to the customer as per Porter's (1985) model, especially since all the trade publishers consulted use these printing methods (Clark, 2019; Impey, 2020; Employee 1, 2019). Companies that enable these technologies are available in South Africa. For example, Jacana Media uses companies like Digital Action and 'Print on Demand', which its core business is 100% based on digital printing or POD technology (Impey, 2020; Van Eeden, 2019). While Bookstorm uses the likes of Amazon and Lightning Source Ingram for POD and SRDP technology in order to reach the local and international audience without incurring a huge financial risk (Clark, 2019). Likewise, Pan Macmillan SA uses the likes of Bidvest Data and Lightning Source Ingram for POD orders for local and international clients (Employee 1, 2019). Trade publishers state that the value is in the acquisition of small number of books for cheaper unit costs, for units ranging between 1- 400 or 500 copies (Clark, 2019; Impey, 2020; Employee 1, 2019). Profit margins are increased for books that would not sell more than 1,000 copies, which is sometimes the case in the South African book economy (Attwell, 2020; Clark, 2019, Impey, 2020; Shaw, 2019). This is also in line with the "long tail" business

strategy of making books with low demand available to booksellers or buyers who request them from trade publishers or booksellers (Anderson, 2006; Clark, 2019; Impey, 2020). Another benefit is derived from printing proof copies for internal uses for trade publishers (Employee 1, 2019; Clark, 2019; Impey, 2020).

This correlates to Birkenshaw's (2003) *conventional method* supply chain system for POD and SRDP within the South African publishing industry. There are existing companies that can service the needs of publishers for POD and SRDP. However, Bidvest Data requires a minimum of 50 copies to be ordered in order to take up a printing consignment from a client (Shaw, 2019). If all printing companies in South Africa operate in this manner, it would mean that the hypotheses reached by some participants about the non-existence of 'true POD' in South Africa is valid (Attwell, 2020; Shea, 2019; Employee 4, 2019). As this will limit affordability for a customer who only needs less than 50 copies. The cost to get the book to the customer would be a factor as well especially if the delivery cost will exceed the retail price of a book. Consequently, only big booksellers or trade publishers could afford to demand delivery of multiple books, even if the consignment consists of different titles. Trade publishers like Bookstorm and Jacana Media also provide multiple services by being points of reference for self-publishing clients (Clark, 2019; Impey, 2020). This enables them to assist clients with editing, distribution, warehousing and selling of books (Shaw, 2019; Clark, 2019; Impey, 2020). This correlates to the *virtual method* mentioned by Birkenshaw (2003). Printing companies are also able to do that by being a point of printing and distributing directly to the customers in order to add value and to offer multiple services and functions (Van Eeden, 2019; Employee 3, 2020; Crouch, 2020; Employee 2, 2020). POD is accessible for customisation, which implies that people who are not necessarily trade publishers can get access to the technology and be assisted from start of production to delivery. The main reason for utilising POD or SRDP is that it is cost effective and allows for a wider reach than when trade publishers would only opt to use offset or letterpress printing (Hall, 2013; Seita, 2017).

Operations— the functioning of trade publishers, academic presses and printing factories are considerate of their workflow and resources in order to remain profitable according to Porter's (1985) supply chain model (Clark, 2019; Employee 3, 2020; Employee 4, 2019). The ability of considering multiple printing methods impacts how publications are produced. For example,

WUP must consider the requirements that POD service providers like Lightning Source request for PDF compliant files, which might influence the skills required from the human resource department of publishers (Employee 4; 2019; Porter, 1985). This is important because there are limitations with regards to page extent, paper stock and trim size (Lewis, 2012; Seita, 2017, Clark 2019; Employee 4, 2019). Therefore, file requirements must align with the printing method. Entities require workflow outputs that take into consideration multiple distribution channels (Employee 4, 2019). And this requires technological skills that are offered by the likes of Electric Book Works, which is a company that offers digital solutions for publishers who want to use multiple formats and distribution channels (Attwell, 2020; Employee 4, 2019; Wilson-Higgins, 2017).

In *Table 2*, Lightning Source Ingram and Bidvest Data are the most popular POD service providers that the participants are affiliated with. This also shows that the local and international POD service providers workflow requirements must be considered. While the table also shows that Kodak USA is one of the most popular providers for printing entities. The technology used must be considered, since all printing companies interviewed have stated that the maintenance and repair cost of digital printer can be expensive. The exchange rate also adversely affects the printers since specialist are usually from overseas (Van Eeden, 2019; Employee 2; 2020). This impacts the publisher's cost of getting the book to the customer (Chang, 2017; Fabling, 2017). Diversification is crucial for printing companies to survive. Production lines of POD or SRDP is more intense, especially since more working hours and skilled labour is required compared to offset printing factories (Crouch, 2020; Employee 3, 2020).The biggest concern for POD is the 24 hours operation which have short delivery time and cooling the machines is a necessity (Crouch, 2020; Van Eeden, 2019; Employee 2, 2020; Employee 3, 2020). Operating cost becomes higher than for other factories because of labour, higher electric bills and breakdowns. The likes of Digital Action and 'Print on Demand' must be highly efficient and reliable in order to remain profitable and to get repetitive printing jobs from clients. Novus Print offers SRDP, POD and offset printing for trade, academic and niche market (Employee 3, 2020; Impey, 2020). Which means that they must consider digital and offset printing workflow systems within their factories. The labour and finishing equipment for digital printing is different from offset printing.

Output Logistics— value added services that deliver the book directly to the customer creates value according to Porter's (1985) supply value chain model. 'Print on Demand' is observed as a direct point of production and delivery point to the customer through offering multiple delivery solutions (Van Eeden, 2019). Paperight operated from 2010 to 2014 as an entity that enabled customers to print books in copy shops around the country by emulating the EBM's system of PDF ready files that publishers made available, but it was a radical transformation according to Attwell (2020), which publishers were not ready to embrace. As Novus Print's management (Employee 3, 2020) and Attwell (2020) mention that the South African publishing industry's inability to embrace POD is the main cause of failure to capture a huge segment of the market. The culture of photocopying portions of textbooks in the academic sector was the basis of using printing shops in a legal manner for Attwell (2020). But scholarly publishers were inherently concerned about DRM and the gatekeeping of intellectual property (Magadán-Díaz & Rivas-García, 2018; Hall, 2016; Attwell, 2020). Digital Action (Employee 2, 2020) and X Mega Digital (Crouch, 2020) service the publishing industry by printing books on demand, while also providing other formats such as brochures and catalogues for customers like Jacana Media (Impey, 2020). The POD or SRDP entities provide services to trade publishers, self-publishers, online retailers, booksellers and to the general public in South Africa. The courier delivery system in South Africa is becoming more affordable, even though there might be a minimum purchase amount from the likes of Takealot.com or other online retailers for free delivery.

Marketing and Sales— the unique selling point or feature described by Porter (1985) for digital printing technology is promoted through Anderson's (2006) "long tail" method, which thrive on capitalising on the backlist that would be neglected if POD was unavailable (Impey, 2020; Employee 1; 2019; Clark, 2019). Additionally, the international market can also be reached through using POD technology or systems that enable POD for trade publishers, self-publishers and for academic presses (Fabling, 2017; Chang, 2017, Employee 4, 2019; Clark, 2019). Maximisation of revenue streams and order fulfilment of backlist or popular titles is still noted as a great reason for using POD or SRDP as noted in the literature review and by the research participants (Tzouvaras & Hess, 2001; Impey; 2020; Clark, 2019). As Warner (2017) states that POD is ideal for titles that have substantially low demand or have reached zero levels of sales through brick-and-mortar bookstores. UBC Press found that POD is ideal to reach international markets, especially for the Australian, USA and UK academic market (Chang, 2019). The

demand for academic books or monographs is unpredictable and increasingly hard to predict because of other learning tools that academics and educators deploy is teaching academic discourse (Morro, 2018; Wilson-Higgins, 2017; Employee 4; 2019). POD and SRDP is the only way in which academic presses can remain profitable as e-publishing continues to grow in academic discourse (Greco, 2015; Chang, 2017; Wilson-Higgins, 2017; Employee 4, 2019).

Services— Printers and publishers offer additional services to the usual market they regularly supply in order to remain profitable and sustainable as per Porter's (1985) model. Niche and customisation markets are easily reached by printers since they can directly deliver to museums, academic presses and to parents that want customised children's books (Crouch, 2020; Employee 3, 2020, Shea, 2019; Laquintano, 2010; Dawson-Cook, 2014). As mentioned in the literature review, the *Integrated publishing/production/retailing model* is known as the internet-initiated sale approach, which prompts the in-house printing process and delivering the book to the customer when demanded (Birkenshaw, 2003). POD service providers also offer digital archiving and system management in order to make it easier for updates of files for clients (Crouch, 2020; Employee 3, 2020; Employee 4, 2019). The niche market is limited to the availability of paper stock and file requirements of printing companies (Clark 2019; Crouch, 2020; Employee 3, 2020; Employee 4, 2019). The Espresso Book Machine (EBM) at UJ main library failed to capture the interest of the students and that is why the initiative was not a success for the South African academic market (Geduld, 2020; Attwell, 2020). However, Birkenshaw's (2003) *In-store production* system through traditional brick-and-mortar booksellers or academic booksellers is not available in South Africa (Kaabwe, 2020; Shea, 2019; Shortt, 2020). This is in line with countries like Canada and New Zealand who do not have enough e-commerce services and infrastructures to enable authentic POD within their countries (Fabling, 2017; Chang, 2017). The other reasons mitigating POD technology is that the books that customers require can be easily obtained from existing brick-and-mortar booksellers or online retailers, or the ordering system does not have copyrights to a comprehensive list of books in their online catalogue system (Shao, 2016).

5.3 Utilisation and Availability of POD for Self-Publishers in South Africa

South Africa has numerous self-publishing providers that often recommend POD or SRDP systems or technology in order to afford clients wider dissemination of their literary works. Rainbird, which is a division of Bookstorm, offers clients the opportunity to distribute their books through the likes of Amazon and Lightning Source Ingram (Clark, 2019). This is ideal for clients that cannot afford the setup cost or deal with the learning curve of operating within the complex ecosystem of digital POD service providers. Self-Publish SA mostly caters to clients that have ready to print books or that are simply on the stage of manuscript development with the options of using SRDP, which is ideal for direct selling (Shaw, 2019). Warner (2017) argues that POD has a negative connotation especially for self-published authors who use it as their only means of printing, since booksellers are discouraged from ordering from vanity presses or publishers. But this is not the case in South Africa, since authors have multiple option than the popular Exclusive Books or CNA distribution channels (Foligno, 2015). However, Clark (2019) acknowledges that SRDP, offset printing and POD are used by self-publishers and they offer the needed support for all printing methods for their clients. The value added by self-publishing providers is with regards to manuscript preparation, copy editing and planning for production to print the books through the most affordable printing method.

When self-publishers partner with established entities in the publishing sector, they can get expert advice from industry leaders, and are awarded distribution channels from publishing houses and distribution companies that have the necessary contacts with booksellers. Warner (2017) states that self-published authors and indie publishers are unaware of how marginalised their publications are in the industry. However, this is not the case for the South African book market, since most self-published authors have collaborations with established industry players who can take them on a step-by-step process to the end goal of being in a bookshelf or through direct selling (Shaw, 2019; Clark, 2019). Authors who want the entrepreneurial experience of self-publishing can invest in services which are crucial, while negating warehousing and distribution costs when using services from iUniverse for international market or by using local self-publishing service providers like Rainbird and Self Publish SA (Haugland, 2006; Clark, 2019; Shaw, 2019). While South African authors can control some of the publishing processes

themselves, there is a need to get third party expertise for editing and distribution if the author is new to the publishing industry.

Companies like iUinverse and AuthorHouse provide the necessary support for digital distribution, but that can also be limiting for self-publishers who have no fan base to work with (Morgan, 2016). Even if South African authors opt for Amazon's Kindle Direct Publishing (KDP), there is a learning curve that they will have to undergo and without the know-how, it can be difficult to navigate the digital platform for first-time authors (Clark, 2019). The distribution partners with Barnes & Noble and Kobo can offer self-publishers the international and local reach (Morgan, 2016). But using international POD service providers can be expensive due to shipping cost for the booksellers and to get books to the customers (Attwell, 2020; Shea, 2019). Rainbird also uses SRDP for their clients for printing custom publications according to Clark (2019). Being able to order small quantities of books allows authors to print and distribute their books themselves (Hall, 2013; Shaw, 2019; Warner, 2017).

For authors with no intention of being bestsellers, they can directly sell their books to their customers through their personal networks as Self-Publish SA clients usually do (Shaw, 2019). This presents self-publishers with the opportunity to manage their cash flow and to invest in the book economy in a manner that allows options from local and international self-publishing providers, such as Amazon's KDP, Bidvest Data and Lightning Source (Clark, 2019; Shaw, 2019). Most self-publishers would not opt to print only one copy as it is not financially viable, as stated by Shaw (2019) and Clark (2019) from Rainbird. This is acceptable and standard practice for profitability and sustainability of self-publishing businesses. Therefore, the company 'Print on Demand' states that their POD technology is business application driven (Van Eeden, 2019), so the quality is suitable for most end users. While the printing company Bidvest Data requires a minimum of 50 copies through short-run digital printing (Shaw, 2019). It means that sustainability is an issue. X Mega Digital, 'Print on Demand' and Digital Action can print from a single copy without limitations, while Novus Print expressed that they do require a certain amount of print runs in order to remain sustainable (Van Eeden, 2019; Employee 2, 2020; Crouch, 2020; Employee 3, 2020). In a sense, SRDP is more ideal for setting up self-publishers in a direction to break-even or possibly make a slight profit for their book sales, until they receive notoriety or widespread popularity in their niche market (Carolan & Evain, 2013; Clark

& Phillips, 2014; Shaw, 2019). At the same time, major booksellers only deal with distributors like Blue Weaver and Book Lingo or self-publishing providers like Rainbird, which has access to distribution through Booksite Afrika. Therefore, Rainbird and Book Lingo can provide self-publishers access to reliable distribution channels and ordering systems that the likes of Exclusive Books and Bridge Books can trust.

5.4 Utilisation and Availability of POD for Academic Publishing in South Africa

According to IT Web (2012), Xerox and Self Publish Press are responsible for bringing the first Espresso Book Machine (EBM) to the University of Johannesburg (UJ), as the first tertiary institution in South Africa to acquire the POD machine. The increased competitions for the scholarly market for university presses such as Wits University Press (WUP), University of KwaZulu-Natal (UKZN Press) and the University of South Africa (Unisa Press) have overlapping markets with other presses such as Human Sciences Research Council (HSRC Press) and the Africa Institute of South Africa (AISA) as mentioned by Veronica Klipp (2017). Additionally, local presses receive little support from university institutions, due to the increasing trend to favour international publishers by academics and universities for prestige and credential benefits (Klipp, 2017; Kotecha, 2009; Greco, 2015). On Demand Books makes books available through their network called the EspressNet, which makes it easier for content providers to load books into their system for metadata management and for tracking sales of English and foreign language content sold by libraries, bookstores or online booksellers and other retailers affiliated with them (IT Web, 2012; On Demand Book, 2015).

However, the EBM is no longer available or used by the University of Johannesburg (Geduld, 2020). This denotes that the technology has not been a popular way to capitalise on the academic market for POD technology. The interest by university libraries for the UK and USA academic sector as discussed by Chamberlain (2012) and Rapp (2011) is not the case in SA's university libraries. Attwell (2020) states that the system like the EBM's offering was not embraced in the South African academic sector for use by photocopying shops due to concerns about their intellectual property and reputation. The people involved in the process of bringing the EBM technology to the University of Johannesburg could not be reached when the research was conducted. However, the system management of the EBM was mainly serviced through Konica Minolta (Geduld, 2020). The location of the EBM is something that remains questionable. There

was still uncertainty when the Library Journal inquired about the number of people who would use the EBM facilities for self-publishing in academia or for general publishing purposes according to Rapp (2011). The expressed concern is valid. Maybe a university library was not the ideal place for the EBM technology, it might not have yielded any profits during the time it was used. There are various locations with the EBM facilities, such as McNally Jackson, which is a bookstore located in New York City (Rapp, 2011). The *In-store production model* as termed by Birkenshaw (2003) is made available in libraries, bookstores and in university stores, but it comes with high production cost. Another obstacle with this model is with regards to copyrights from publishers (Magadán-Díaz & Rivas-García, 2018; Hall, 2016; Attwell, 2020). The expressed concern of embracing POD by academic publishers is something that has been expressed by the printing factoroy Novus Print and the POD enabler Paperight, which closed in December 2014 due to financial constraints (Employee 3, 2020; Attwell, 2020). If academic publishers are having an issue with the affordability of POD and the fear of copyright is an issue, it is highly unlikely that printing factories will remain operational without diversifying their businesses. Maybe the EBM technology would have fared better in a suburb that has an Exclusive Book compared to being placed in a university library filled with students who are mainly focused on their academic studies. North-West University found the use of POD to be irrelevant to them (Vos, 2019).

WUP introduced a revised workflow that allowed them to use POD for international clients in countries like Canada, UK and USA (Employee 4, 2019). While for South African consumers, SRDP is utilised as there are no affordable POD facilities available for WUP (Employee 4, 2019). This shows that authentic POD is not available in a manner that the academic market can afford in South Africa. According to participants it is available, but it would have to be an affordable alternative to the offset system or SRDP, which seems to be more effective in the academic sector. The notion that POD technology is beneficial for academics and small publishing entities, since it has survived the ebook phenomenon according to Lewis (2012) is refuted when it comes to the academic libraries and academic press in South Africa (Geduld, 2020; Vos, 2019; Employee 4, 2020). The South African academic market survives purely on digital printing and offset printing for popular publications. The sentiments that POD is suitable for academic publishing is not the case in South Africa as suggested by the likes of Greco (2015), Lewis (2012) and Rapp (2011). The cost of shipping and importing cost is seen as a

deterrent for ordering books through POD service providers which do not have printing facilities within that country (Chang, 2017; Shao 2016; Attwell, 2020; Employee 4, 2019). True POD seems to be more affordable in the USA, UK and Australia, but more expensive in countries like Canada, New Zealand and South Africa (Chang, 2017; Fabling, 2017; Attwell, 2020; Employee 4, 2019). However, SRDP offers WUP opportunities to make monographs available for their customers in South Africa (Employee 4, 2019). There is also an inherent limitation for using POD when it comes to artwork books or graphic books which require colour treatment as mentioned by Employee 4 (2019) from WUP. Almost all the printing companies interviewed service the academic sector, which is a huge market for SRDP, since they often do print runs that are less than 500 or 1,000 copies (Van Eeden, 2019; Employee 2, 2020; Employee 3, 2020; Crouch, 2020). They expressed that there are no limitations to the number of books that can be printed, however they do require a consistent production line in order to remain profitable. While Paperight aimed to enable POD for the academic market, as a system that would be a network for publishers to enable students that cannot afford purchasing a paperback or hardcover textbook.

5.5 Technologies, Investments and Affiliated POD Suppliers Utilised

The printing entities play a huge role in making POD or SRDP available in South Africa. Attwell (2020) had no affiliation with POD service providers for Paperight. While 'Print on Demand' by Van Eeden (2019) partnered with Xerox in South Africa to provide POD services. Digital Action has partnered with Kodak to provide POD services (Employee 2, 2020). X Mega Digital is affiliated with Kodak USA and Konica Minolta (Crouch, 2020). Novus Print is affiliated with Kodak USA, Ricoh and Cannon according to Employee 3 (2020). As per *Table 2*, printing entities have collaborated with companies that are instrumental in enabling digital technologies, which have benefited from the innovative collaborations from the likes of Kodak USA and Xerox as mentioned by Wilson-Higgins (2017). In South Africa, innovation is displayed by the likes of Paperight by enabling copy shops to be printers (Attwell, 2020). As a result, POD in academia, international trade publishing and niche publishing has benefited from Lightning Source Ingram's initiative to collaborate with IBM and Kodak (Wilson-Higgins, 2017; Chang, 2017; Crouch; 2020). According to the research findings in *Table 2*, most trade publishers, self-publishers and the academic press utilise services from Lightning Source and Amazon as one of the true POD service providers for international clients. The common link with the entities that have been instrumental in digital publishing such as Xerox and Kodak shows that they have

gained a market share not only as the preferred suppliers in the UK or USA, but the printing entities in South Africa have also partnered with these companies too. Kodak USA is the most popular digital printing service provider, which is followed by Konica Minolta for the printing companies as per the findings.

These companies have gained a huge market share in being enablers of POD and SRDP in South Africa. As crouch (2020) states that the "click rate" option enables them to invest in these technologies without paying upfront. The "click rate" option is like a prepaid option as opposed to having a contract that binds a company to pay a certain amount, irrespective of the orders that they received from clients for POD or SRDP orders. The finishing equipment such as binders are expensive and are usually purchased by the printing companies upfront (Crouch, 2020). Konica Minolta also leased and maintained the EBM that was utilised by UJ, until their lease concluded (Geduld, 2020). Toner digital printers are the most popular machines that printing entities invest in for their digital printing demands. This is due to the better quality attained by using toner-based printer compared to ink jet printers according to the printers.

Pan Macmillan SA, Jacana Media, Bookstorm, Rainbird and Self-Publish SA do not have any interest or investment in POD machinery or equity stake in any POD entities (Clark, 2019; Employee 1, 2019, Impey, 2020, Shaw, 2019). This is different from publishing companies like PPMG, which owns printing companies or POD production lines in order to limit capital investment and risk for publishers (Shao, 2016). All trade publishers that participated in the research rely on the printing entities or POD or SRDP service providers, while Amazon and Lightning Source are utilised as the ideal distribution points for ebooks and POD services. Jacana Media is not affiliated with Amazon or Lightning Source, since they usually prefer to deal with agents for language translation and copyrights acquisition for their international market. Jacana Media solely relies on X Mega Digital, Digital Action and 'Print on Demand' for print runs that range from 1-300 or up to 400 copies (Impey, 2020). This shows that the local entities are adequately equipped to provide POD or SRDP. It also correlates with the sentiments that it is better to use local printing entities for the local market and reserve the likes of Amazon or Lightning Source for the international market (Clark, 2020; Employee 4, 2019, Impey, 2020). This is ideal for trade publishers, authors or academic presses that have books that are popular in the South African book market and internationally. The benefits and challenges of these

technologies are discussed further in relation to what has happened in the past decade to enable digital printing in South Africa.

5.6 Benefits, Challenges, Cost Implications and Usefulness of using POD Technology

Turnaround time— one of the biggest advantages mentioned by the research participants is the turnaround time it takes to produce books by using digital printing as opposed to using offset printing (Employee 1, 2019; Impey, 2020, Van Eeden, 2019; Employee 2, 2020). This is beneficial for publishers, authors and printing entities. As per literature review, Chang (2017) and Gallagher (2014) mention that the turnaround time is crucial for retention of customers because it can encourage them to buy a book or not, especially for the academic market. The printing entities operations for POD or SRDP providers is completely different from offset factories, since more print jobs are required in order to break-even or to make a profit (Crouch, 2020; Tzouvaras & Hess, 2001; Employee 3, 2020). The turnaround time is a challenge for printing factories. As Crouch (2020) mentions that POD factories usually have short-lead times, which means that their factories operate 24 hours per day. The machines take a lot of strain and require cooling. Multiple printers are required, especially if one of the printers break down. Printing equipment requires constant updates in order to remain competitive, while improving the quality to be closer to that of offset printing (Employee 2, 2020, Van Eeden, 2019, Crouch, 2020; Employee 3, 2020). This is crucial for order fulfilment and for making sure that inventory is readily available for readers and booksellers.

Easy to update files and information— it is easy to update information when using digital printing because the PDF files are easily updated and stored digitally (Crouch, 2020; Employee 3, 2020). The PDF ready files make reprints and experimental publishing to be possible (Hall, 2013; Warner, 2017; Seita, 2017). The metal pressure plates used for letterpress printing is expensive to amend (Chang, 2017; Warner, 2017). Therefore, digital printing is ideal for proofs and for information that is not permanent as trade publishers mentioned that they use POD for internal and external purposes in 4.2. The downside with digital printing is that WUP must adhere to the file requirements set up by Lightning Source (Employee 4, 2019). This compromises the in-house style of the academic publisher, especially for monographs which have more than 740-page length and unusual page sizes (Lewis, 2012; Seita, 2017). This means

that publishers will have to condense information in order to meet the requirements. Which can result in different layouts for the same book title based on the method of printing.

Access for the niche and customisation market— authors, publishers, booksellers and printers create opportunities for niche markets and for customisation of children's books, museums and thesis printing (Van Eeden, 2019; Crouch, 2020; Shea, 2019; Employee 3, 2020). New markets emerge for the publishing and printing industry by offering customisation. As mentioned in the literature review, POD or SRDP is suitable for niche publications because of geographical limitation or segmented markets, which makes it easier to update information through digital technologies (Seita, 2017; Laquintano, 2010; Dawson-Cook, 2014). This is a huge benefit for printing entities because they can have clients that would be turned down by trade publishers. The self-publishing market can experiment and flourish because of what they can do. However, some markets like museums and children's book sector are highly experimental, which could be limited by the cover design and paper stock available from digital printing factories (Clark, 2019; Crouch, 2020). This means that these markets might not get the desired effect for book cover designs or to use the desired paper in order to achieve their goal. Paper is expensive and must be coated (Crouch, 2020). Expensive paper cost can result in high unit cost for the end user.

Warehousing and Logistics Management—Shipping costs for international customers is avoided by using POD service providers with an international reach and it is environmentally friendly (Clark, 2019; Employee 4, 2019; Employee 3, 2020). The impact on the environment can be a selling point for others. POD is useful for WUP because it has afforded the academic press to penetrate the overseas market, while maintaining reasonable administrative and logistic costs (Employee 4, 2019). However, Fabling (2017) states that POD is highly expensive for New Zealand because of the unique situation of publishers and printing companies operating outside of the country. Most participants state that the benefit of using POD or SRDP is in reduction of wastage and obsolete stock. However, POD is not always cheap. As Bridget Impey (2020) mentions that the catalogue for their backlist that will be exclusively available on POD will be more expensive than the initial original retail price.

Trade publishers and self-publishers have the added pressure to determine the distribution costs from the likes of Booksite Afrika or other distributors. This also lowers their transportation costs as the books are distributed as a collective from other trade publishers and self-publishers. The

effects of transportation and storage costs are variables which cannot be accurately determined and are applicable in relation to how the initial print run of the book is received by the book market (Chang, 2017; Warner, 2017). Printers must look at the inputs of acquiring digital toners from overseas or from South African suppliers, which is something that Crouch (2020) deems as expensive, even though there are now affordable alternatives. The quality would not be the same as the recommended toner or ink by the manufacturer. This requires great planning from management in terms of skill training and resource management in order to get the right POD services for the right titles as states Employee 4 (2019) from WUP and Employee 3 (2020) from Novus Print. Although the unit cost is generally higher for POD or SRDP, the added value is in the traditional centres of huge savings in warehousing, shipping or promotion work that is derived from POD service providers (Attwell, 2020; Employee 4, 2019). This requires human resource skills as per *Figure 1* for the finance department to be smarter when working out the added value of using POD or SRDP as opposed to offset printing (Porter, 1985; Clark, 2019; Attwell, 2020; Employee 4, 2019; Employee 3, 2020).

Inventory management and less wastage— book returns are reduced as a result of using POD technology (Employee 4, 2019). POD mitigates the risk of printing huge quantities, especially since it is hard to predict demand in the publishing industry from the onset (Attwell, 2020; Van Eeden, 2019, Employee 2, 2020). Employee 3 **(**2020**)** states that their clients can use conventional print methods to meet conservative sales forecasts and avoid printing excess stock that will go to waste. Jacana Media prints about 20% of printing jobs through POD and 80% through offset (Impey, 2020).

This is crucial in a world where information is constantly changing (Hall, 2013; Greco, 2015). Publishers do not have to order 1,000 copies, while they only need less than 1,000 copies within their financial year because they will have to write-off stock that they could not sell. For printers, they also purchase consumables that they need, and therefore can minimise wastage (Crouch, 2020). There is an increase in metadata management and compliance requirements for POD files, even though there is a reduction in warehousing and inventory management cost (Employee 4, 2019; Clark, 2019). Which is the case for the academic presses that use POD service providers like Lightning Source and BookMobile (Chang, 2017; Employee 4, 2019). As Chang (2017) states that the unit cost might be cheap with Lightning Source compared to BookMobile, but the

shipping cost with Lightning Source is higher than BookMobile and UBC Press receives excellent service from BookMobile. In South Africa, Paperight was not embraced by academic publishers due to the perception of being too extreme, despite the culture of photocopying books in the country, and lack of accessibility to ebooks is a problem (Attwell, 2020; Foligno, 2015; Gaigher et al., 2014; Attwell, 2015). Exclusive Books and CNA are criticised by Foligno (2015) for the high discount of 45-55% that they usually get from publishers. The distribution process is seen as a huge problem in South Africa, especially since ebooks have not taken over in South Africa due to poor ICT and infrastructure (Foligno 2015; Kotecha,2019). Attwell (2020) states that true POD model is not a reality in South Africa, especially when it comes to POD providers like Amazon and Lightning Source because they printers are outside the country and this makes the books expensive due to postage and import duties. Shao (2016) states that is why in China distributors have taken the duty of being POD service providers so that they can manage the process of printing and inventory levels, especially for academic and professional books. There is a need to change management within organisations— just for the purpose of meeting POD requirements (Employee 4, 2019; Porter, 1985). This affect the supply chain system and issues of consumer habits, reliability and relationships with suppliers must be considered in providing POD or SRDP services (Shao, 2016; Chang, 2017; Fabling, 2017).

Higher unit cost, maintenance cost and labour cost— True print-on-demand is expensive per unit cost in South Africa (Attwell, 2020; Employee 4, 2019; Clark). Due to the rapid change in technology, POD equipment requires more financial investment than offset technology (Crouch, 2020; Van Eeden, 2019; Employee 2; 2020; Employee 3, 2020). According to the printing entities the maintenance of the printing equipment is very expensive and requires experts from overseas to fix the equipment. Employee 3 (2020) from Novus Print states that the cost of maintenance and replacing spare parts usually adds up for POD printers to the point that it is not profitable to print small batches. Employee 3 (2020) states that POD operators require multiple skills such as multi-disciplinary operators who can do all the production tasks that are usually separated for letter press production to prepress operators, press minders and folding operators.

The printing entities mention that the cost of maintaining the POD machinery is one the biggest challenges for them (Crouch, 2020; Employee 2, 2020; Attwell, 2020; Van Eeden, 2019; Employee 3, 2020). For digital technology to match the same quality as letterpress technology

there is a constant need to update the technology used by all the printing entities to match the quality offered by their competitors. It takes longer for POD or SRDP factories to break-even as they must take more printing jobs compared to offset printers (Crouch, 2020; Warner, 2017). This results in more printing jobs in order to make the same profit margins as the offset printers. Ironically, this is applicable to publishers as well. Therefore, this puts more strain on their machinery, which requires more maintenance and regular updates in order to remain competitive (Crouch, 2020, Employee 2, 2020). The quality is credited by the likes of Jacana Media, and it is no coincident that 'Print on Demand', Digital Action and X Mega Digital are mentioned by Bridget Impey (2020) as their go to printers for POD or SRDP orders. This shows that the investment they place in maintenance and system update is paying off for them.

Cash Flow Management— POD or SRDP becomes a huge advantage in situations where the publisher is uncertain about selling 1,000 copies of a book title, while true print-on-demand is solely reliant on the customer order as and when it is demanded, states Attwell (2020) and Shea (2019). True POD mentioned by Gallagher (2014) and print to order (PTO) mentioned by Chang (2017) are similar methods that allow the customer to drive the purchasing process. The advantage is that the publisher can make a sale without managing the process of delivering the book. Short-run digital printing often requires publishers to handle customer service themselves and that is one of the differences when it comes to true POD option (Attwell, 2020). While booksellers must ensure that the books that are needed are readily available to retain customers, even if they do not make a profit by ordering books from other bookstores (Fabling, 2017).

It can be hard to predict demand and there are book titles that could benefit from using the POD *In-store production* model that Birkenshaw (2003) suggested, since Van Schaik Bookstores had titles that were not available in stores (Kaabwe, 2020). The *In-store production* system does not exist in South African bookstores. Bookstores get books directly from distributors or publishers, but they avoid ordering from clients that use international POD suppliers because the books become expensive for the customer (Shea, 2019; Attwell, 2020; Fabling, 2017).

The biggest challenge is postage fees and import duties from overseas and that makes it expensive for the customers at the end of the day (Attwell, 2020; Fabling; 2017; Chang, 2017). Since Amazon printers are usually elsewhere in the world, South Africa does not have true print-on-demand when they utilise their services (Attwell, 2020). Employee 3 (2020) from Novus

Print states that South Africa has not embraced POD like how Europe and North America have adopted it and subsequently the demand is insufficient to achieve positive return on investment for their production lines.

However, the higher unit cost is generally mitigated by greater returns on investment, therefore, profitability is high when using POD for academic presses for international sales (Employee 4, 2019). This is due to the exchange rate that affects printers adversely for consumables and maintenance, while it can be beneficial for academic publishers if the rand is weaker (Employee 3, 2020; Employee 4; 2019). The technology used by Lightning Source allows trade publishers and academic presses to expand on their local and international reach, while they create additional income streams (Wilson-Higgins, 2017; Greco, 2015).

Financial reporting becomes a challenge as organisations move away from unit price-based costing to more complex methods of calculating profitability (Attwell, 2020; Employee 4, 2019). There is a need to do sums differently with short-run digital printing or true POD as compared with traditional means of printing huge quantities at once (Attwell, 2020). All the participants who use POD mentioned the number of quantities in relation to the cost of offset printing as an incentive for using POD or SRDP (Employee 1, 2019; Impey, 2020, Van Eeden, 2019; Employee 2, 2020; Employee 4, 2019; Crouch; 2020; Shea; 2019; Attwell, 2020). The tipping point is another benefit for using POD technology compared to offset printing (Clark, 2019; Crouch, 2020). The tipping point is crucial because it is not easy to assess at what point the publisher should use offset printing, POD or SRDP (Hall, 2013; Bullock, 2012). The average number that seem to be beneficial for using POD or SRDP technology is between 1-1,000. Even though participants such as Shaw (2019) and Clark (2019) would opt for a minimum of 50 copies and less than 500 copies respectively, but not for a minimum of less than 50 or a single copy. While anything passed 1,000 copies will not be beneficial for using digital printing technology. Although Crouch (2020) states that 750 is the maximum that would be ideal for digital printing. The tipping point is dependent on various variables and differs from print job to print job (Bullock, 2012; Hall, 2013; Warner, 2017). But there is no exact number that can be given with certainty, since it is reliant on other production costs such as paper, ink, equipment maintenance and other variables that are beyond the control of the entities. It is important to consider all these

challenges and benefits in order to select the most suitable method of production for the stakeholders, while also making sure that there is enough money to keep the lights on.

5.7 Quality of POD Technology compared to Offset Technology

The problem statement refers to what are the challenges and benefits of POD in South Africa. Quality is identified as one of the most important factors when it comes to advancing digital technology (Chang, 2017; Wilson-Higgins, 2017; Shao, 2016). The consensus is that quality has improved from 2009 to 2019, even though there are still challenges to digital printing as opposed to letterpress printing, especially for colour work, halftones and for variety (Impey, 2020; Attwell, 2020; Employee 3, 2020; Employee 4, 2019). Halftones have been identified as a huge obstacle for colour work (Lewis, 2012; Bullock, 2012; Employee 3, 2020).

The biggest challenge observed by participants is with regards to the quality of colour matching when using POD or SRDP technology compared to offset printing (Clark, 2019; Impey, 2020; Employee 1, 2019). As Impey (2020) states that the quality printed through SRDP does not compare with offset printing from the likes of Novus Print or ABC Press. As Lewis (2012) states that for titles that have images with high resolution, it can be problematic to match the quality that is associated with letterpress printing. WUP uses an overseas POD service provider according to Employee 4 (2019) and heavily graphic titles or artbooks with colour images are difficult to produce with POD technology. There are still limitations for colour treatment when it comes to colour quality. Although, Van Eeden (2019) states that the quality on the new ink jet technology is superb for business purposes since the quality is good enough for business applications, but it is not close to letterpress printing. It shows that there are still limitations with digital printing.

Novus Print provided a perfect illustration in *Figure 2* of how ink jet technology cannot reproduce clear images when compared to letterpress technology (Employee 3, 2020). However, the toner-based digital technology is closer to the offset quality than the ink jet machines, especially with the help of colour management software (Crouch, 2020; Employee 3, 2020; Van Eeden, 2019). Offset printing still gives superior quality than any form of digital printing (Hall, 2013; Bullock, 2012). This correlates with the reason why trade publishers like Pan Macmillan SA, Bookstorm and Jacana Media avoid using POD technology for book production with colour work in it, but find it reasonable for limited colour book and for black and white text work

(Employee 1, 2019; Clark, 2019; Impey, 2020). However, the digital printers are constantly updating their technology and the colour is closely matching the quality of offset or letterpress printing.

The quality for self-publishers is deemed adequate and Shaw (2019) attest that clients are satisfied with the quality of the work produced by Bidvest Data for SRDP. Clark (2020) from Rainbird states that the average buyer cannot tell the difference between digital printed book and letterpress printed books. The limitation in paper stock and quality is another challenge that has been identified (Attwell, 2020; Crouch, 2020), but it has drastically improved compared to when digital printing started. However, it can affect the visual quality for production of books that require thicker paper stock. As a result, the differences between digital printing, POD and letter press printing are not noticeable to the average book buyer according to Employee 4 (2019) and Clark (2019).

5.8 POD's Impact on Customers

The impact of POD on customers is not noticeable from a bookseller's perspective in South Africa. It correlates with the notion that most book buyers are not aware of the differences in printing methods (Clark, 2019; Shaw, 2019; Employee 4, 2019). The South African reading public is used to the quality that they get. Another major benefit for quality control is the increase improvement in digital printing technologies over the past decade (Wilson-Higgins, 2017; Seita, 2017).

5.9 The views of Booksellers for Books Produced by POD Technologies

There is no negative feedback reported to self-publishers regarding to the quality of POD books. In fact, there is an increasing trend to opt for multiple printing option in order to supply demand for bestselling books (Clark, 2019). Malcom Gladwell's differences of book quality in printing methods was identified by Clark (2019) by looking at the covers, but to the average consumer with no experience in book production, they would not be able to spot the differences. As discovered that POD or SRDP is the best for supplying inventory because of the turnaround time. And this ensures that the booksellers can deliver books to the end user in a best way without losing potential sales, since books are not essential items (Fabling, 2017).

5.10 POD Options Offered to Authors

Rainbird customises books that were once part of the trade market for private clients (Clark, 2019). Sally Shaw's (2019) clients are provided with the same printing options. The consensus is that self-published authors leave the printing method to the self-publishing providers. Some clients often think that SRDP is the same as POD (Clark, 2019). This shows that authors are often not aware of the differences. It is a matter of fulfilling demand as opposed to worrying about the quality or the aesthetic appeal of a book. The South African book market has been introduced to all forms of printing methods and the quality is unnoticeable to their client. Only industry experts like Clark (2019), Attwell (2020) and Employee 4 (2019) from WUP would notice the difference, only because they are invested in the production process of books.

5.11 Data Analysis Findings

POD or SRDP is particularly useful for trade publishers. While self-publishers can benefit from using both printing methods, there are minimum order requirements when using SRDP in South Africa, and it would not be commercially viable to order just a single copy (Shaw, 2019; Hall, 2016; Clark, 2019). In academic publishing, POD is useful for the international market for the academic press and SRDP is used to supply the local market, however, university libraries have not benefited from using digital printing technologies (Employee 4, 2019; Vos, 2019; Geduld, 2020).

Printing entities have not seen huge profit margins in supplying POD or SRDP because of expensive printing technology and maintenance cost that add up at end of the financial year (Crouch, 2020; Employee 2, 2020; Employee 3, 2020; Van Eeden, 2019). Postage fees is one of main reasons why 'true print-on-demand' does not exist in South Africa according to Arthur Attwell (2020). This is a similar trend to New Zealand, which finds itself in a unique position with publishers operating in Australia or the UK (Fabling, 2017). The postage fees and import duties make true POD more expensive (Attwell, 2020; Fabling, 2017). In the long run it becomes expensive to order a book on Amazon as there are shipping costs or custom costs to consider, and the printing of books from the likes of Amazon and Lightning Source Ingram is done overseas (Attwell, 2020; Employee 4, 2019). Even though a similar version of Amazon and Lightning Source Ingram exist in the form of Takealot.com and Loot, Morgan (2016) observed that these distribution channels are expensive for self-publishers. This is the case specifically for

small publishers and self-publishers who cannot afford to lose the slight profit margin they can make from publishing their literary works. However, Takealot.com has local printers for POD or SRDP services from the likes of ‘Print on Demand’, which is based in Cape Town (Van Eeden, 2019). The distribution channels can be expensive for clients, due to the need to pay for courier services to get the books delivered to them at a cost of R 60 or to purchase goods or services worth R 450 in order to qualify for free delivery or collect at one of Takealot.com’s pickup points across the country.

Chapter 6: Conclusion and Recommendations

6.1 Conclusion

The aim of the investigation was to uncover the benefits and challenges inherent to the adaptation of POD in South Africa from 2009 to 2019, especially in comparison with North America and Europe's take on digital printing technologies. The biggest challenge identified in the research study is with regards to demand and profitability for all the industry players (Employee 3, 2020; Crouch, 2020; Attwell, 2020). POD or SRDP is distinguished by the benefits and the challenges it is confronted with in South Africa compared to the global book market. The added value for POD or SRDP is that it allows for better cash flow management and the mitigation of the risk associated with ordering too much inventory, without 100% certainty of making sales and by avoiding keeping stock for a prolonged period (Attwell, 2020; Clark, 2019; Employee 1, 2019; Impey, 2019).

Therefore, POD is mostly useful for financial reasons, speed, reduction of inventory overload and for the environment for trade publishers, printers, self-publishers and for academic presses. But it is not useful for certain book sizes and limited to paper stock available. And this is a disadvantage for using POD, especially for monographs with huge page length and colour content (Lewis, 2012; Seita, 2017). POD is particularly not useful for booksellers, since they are mostly concerned with the quality of the book and not about the method of production. It is not useful for South African university libraries, since there are no investments in POD technology or interest in printing books.

The biggest advantage with regards to using POD or SRDP is the number of copies that can be purchased without incurring storage cost and obsolete stock, which is observed as an advantage by Bookstorm, Jacana Media and Pan Macmillan SA (Clark, 2019; Impey, 2020; Employee 1, 2019). The tipping point is observed in South Africa as a direct correlation of how it affects profits for the entities (Clark, 2019; Attwell, 2020; Hall, 2013; Chang, 2017; Warner, 2017). The trade publishers must weigh their options based on which printing option will deliver content to the end user, and as well as offer economic freedom to the publishing houses. It is important for trade publishers to assess the risk associated with acquiring inventory, and to make sure that they keep their options open in order to capture the market share to the fullest potential. Clark (2019)

states that Bookstorm outsource printing from USA entities to service the international market by using POD. When it comes to authentic POD, most trade publishers are willing to look to the USA or to other international suppliers for the most cost-effective option. While Jacana Media uses only local printing service providers for all printing methods (Impey, 2020). Pan Macmillan SA uses both local and international POD and SRDP service providers (Employee 1, 2019). The self-publishing providers usually utilise SRDP with minimum requirements to remain profitable for their clients and operations, while considering the complete supply chain by including readily available POD service providers like Amazon and Lightning Source (Birkenshaw, 2003; Shaw, 2019; Clark, 2019; Porter, 1985).

The impact of cost is assessed through adding value for making the backlist or customisation of trade books for private clients available through self-publishing and academic presses by analysing the 'long tail' method cost effectiveness of being profitable to all stakeholders (Anderson, 2006; Clark, 2019; Employee 4, 2019). It becomes complicated to evaluate the added value of providing small batches of books from the printing entities when the demand is insufficient and the printing companies need to diversify, while publishers and academic presses have to consider their local and international readers (Chang, 2017; Wilson-Higgins, 2017; Attwell, 2020, Employee 4, 2019, Employee 3; 2020). As per findings in *Table 2*, printing entities have collaborated with companies that are instrumental in enabling digital technologies, which have benefited from the innovative collaborations from the likes of Kodak USA and Xerox as mentioned by Wilson-Higgins (2017). When the traditional variables like warehousing, shipping and wastage are reduced or completely negated, it becomes a different scenario for publishers and for the printing companies (Haugland, 2006; Fabling, 2017; Employee 4, 2019; Chang, 2017).

However, stakeholders must consider complicated workflow and cashflow changes in the POD or SRDP environment. The initial setup costs with the likes of Lightning Source Ingram might be high (Employee 4, 2019; Fabling, 2017; Chang, 2017), but in the long run the return on investment of such printing option is beneficial because of the ability to print huge volumes in a financial year, by the likes of Lightning Source and Amazon (Attwell, 2020; Clark, 2019; Employee 4, 2019). This is beneficial for the international market in North America or Europe. In South Africa, the demand is still substantially low compared to the demand from North

America and Europe and as a result the unit cost cannot be reduced to equal or beat the international prices (Employee 3, 2020; Attwell, 2020; Employee 4, 2019; Kaabwe, 2020). Another variable that affects the cost price of delivering books from overseas POD service providers is the postage fees identified by Attwell (2020) and expensive paper treatment identified by Crouch (2020). It makes sense that publishers will be mostly affiliated with entities that will create value for their end users, while also offering better returns on investment for them. Interestingly, SRDP is generally used in South Africa to deliver content to end users by most publishers (Clark, 2019, Employee 4, 2019; Shaw, 2019). But most entities avoid ordering a single copy of a book and printers also prefer that a minimum of copies or batches to be processed through the production lines, so that they can also generate profit and remain sustainable (Crouch, 2020; Employee 3, 2020).

Expensive printing equipment and maintenance of servicing machinery is identified by all the printing entities as one of the biggest problems (Employee 2, 2020; Van Eeden, 2019; Crouch, 2020; Employee 3, 2020). Therefore, the EBM is observed as an expensive solution for the South African book market (Attwell, 2020) and as a result the EBM that was in the University of Johannesburg was removed from the institution due to low demand (Geduld, 2020). Self-publishers need options which will allow them to order small batches and then directly sell the books to their customers, before they can make another purchase (Shaw, 2019). The issue of expensive investment in equipment and maintenance cost is directly correlated to the unit cost and demand. The lower the demand, the more difficult it is for printers to offer competitive prices. This is probably why most printers like Digital Action, ‘Print on Demand’, X Mega Digital and Novus Print offer customers other printing services such as printing brochures, catalogues, printing thesis for universities and other book production services in addition to POD or SRDP (Employee 2, 2020; Crouch, 2020; Van Eeden, 2019; Employee 3, 2020). There is a need to ensure that there is more money set aside to pay for the specialist who service the POD machinery (Employee 2, 2020; Crouch, 2020; Employee 3, 2020). Cash flow management is a reality for publishers and printers alike. It requires the publishing and printing entities to apply flexible business models in order to survive and to be sustainable in the long run (Porter, 1985; Anderson, 2006; Birkenshaw, 2003).

Printers are struggling to add value because of the low demand for digital printing. Therefore, production lines will be more profitable if the demand increases or if the cost of digital printing is equivalent to the unit cost of 1,000 copies that are printed by letter press factories. Booksellers and buyers have no problems with the quality of books produced with digital technology, as the publishing and printing industry uses all forms of printing methods to meet demand, and customers hardly notice any apparent differences in the different printing methods.

6.2 Recommendations

It would be great to observe how POD will affect the South African book industry from a point of distribution, once the likes of Amazon and Lightning Source Ingram have established POD services directly from South Africa, especially by using South African printing companies. The costs associated with POD is noted as a huge problem by industry experts (Chang, 2017; Attwell, 2020, Clark, 2019; Employee 4, 2019). And that has caused the South African publishers to be unlikely to embrace ‘true print-on-demand’ or print to order method directly available to the buyer (Attwell, 2020; Gallagher, 2014; Chang, 2017). At the same time, it would be interesting to investigate innovative digital solutions for distribution purposes, solely based on order-based POD. The solution should be buyer driven from all social classes as opposed to output driven from a publisher’s perspective.

The attitudes of the publishers towards POD or SRDP is the driving force in embracing digital printing technology in South Africa. At the same time, the biggest booksellers like Exclusive Books are not driving the technology. There is an opportunity to innovate like how Paperight did in order to resolve issue of scarcity and accessibility for academic content, especially for students and the general public that cannot afford paperback or hardcover copies of books.

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Annexure 1

Participation Information Sheet

Dear Sir/Madam

My name is Thomas Mabaso; I am currently studying for a Master's degree in Publishing Studies at the University of Witwatersrand. I would appreciate your participation in the research study entitled 'Print-On-Demand in Book Publishing in South Africa for the Past Decade'. The aim of the research is to investigate the use of POD technology and to describe the challenges and benefits of using POD technology in South Africa compared to the rest of the world.

I would like to invite you to participate in the research study. Participation is voluntary. You are free to withdraw from participating at any given time without enduring any consequences or benefits. You reserve the right to be anonymous. Confidential information will not be reported. The research involves an email interview guide and responses will be kept in a password protected computer. The study will be a research report for the purpose of obtaining a Master's qualification in publishing studies and will not be used for financial gain. The research will be published in an online repository upon completion.

I will have access to the emailed feedback of the responses to the interview or to a recorded telephone interview if you are unable to respond to emailed questions. If you would like a summary or copy of the research report, it will be made available to you.

Please feel free to contact me or my supervisor should queries or questions arise. Our contact details are available below. If you would like to participate in this research study, please keep this participation information sheet and complete the attached consent form as a formal agreement for participation.

Thank you.

Thomas Mabaso
1774653@students.wits.ac.za

Supervisor: Colleen Dawson
Collen.Dawson@wits.ac.za

Annexure 2

Informed Consent Form: Participation in Research Study

I _____ consent to participate in the research study entitled, 'Print-On-Demand in Book Publishing in South Africa for the Past Decade'. I fully understand the conditions attached to the research and provide consent for my participation in the research study. I consent for Thomas Mabaso to include the responses from the data collection guide in the research findings. Please tick ☑ the applicable box.

	Yes	No
I understand that participation is voluntary.		
I would like to remain anonymous.		
I understand there are no consequences or benefits for participating.		
I understand that I can withdraw my responses from this study at any stage of the research process.		
I understand that my personal details will not be included in the research report.		
I understand that the feedback will be kept in a password protected computer.		
I would like to consent to an audio recording for a telephone interview.		

I **do** give consent to complete the questions emailed by Thomas Mabaso.

Date: _____ Signature: _____

This section is only applicable if participant is unable to answer emailed questions.

I **do** consent to be recorded in a telephone interview with Thomas Mabaso.

Date: _____ Signature: _____

I **do** consent for Thomas Mabaso to contact me via telephone to answer the questions in a recorded interview on the _____ on the following contact numbers _____.

Date: _____ Signature: _____

Annexure 3

Interview guide for Participants

Questions Applicable to **Trade Publishers**

1. Does the entity use Print-On-Demand (POD)?
2. In what circumstances does the entity use POD?
3. Which POD technologies does the entity utilise?
4. What are the benefits of using POD technology compared to offset printing?
5. What are the challenges of using POD technology compared to offset printing?
6. What are the cost implications of using POD technology?
7. How is the quality of POD technology compared to offset printing?
8. Why does the entity find POD technology useful or not useful?
9. What POD investments does the entity have?
10. Does the entity have affiliations with POD service providers or entities?
11. Which POD service providers or entities is the entity affiliated with?

Questions Applicable to **Printing Entities**

1. Does the entity use Print-On-Demand (POD)?
2. In what circumstances does the entity use POD?
3. Which POD technologies does the entity utilise?
4. What are the benefits of using POD technology compared to offset printing?
5. What are the challenges of using POD technology compared to offset printing?
6. What are the cost implications of using POD technology?
7. How is the quality of POD technology compared to offset printing?
8. Why does the entity find POD technology useful or not useful?
9. What POD investments does the entity have?
10. Does the entity have affiliations with POD service providers or entities?
11. Which POD service providers or entities is the entity affiliated with?

Questions Applicable to **Booksellers**

1. Does the entity use Print-On-Demand (POD)?
2. In what circumstances does the entity use POD?
3. Which POD technologies does the entity utilise?
4. What are the benefits of using POD technology compared to offset printing?
5. What are the challenges of using POD technology compared to offset printing?
6. What are the cost implications of using POD technology?
7. How is the quality of POD technology compared to offset printing?
8. Why does the entity find POD technology useful or not useful?
9. What POD investments does the entity have?
10. Does the entity have affiliations with POD service providers or entities?
11. Which POD service providers or entities is the entity affiliated with?
12. How does POD help customers?

Questions Applicable to **Self-Publishing Providers**

1. Does the entity use Print-On-Demand (POD)?
2. In what circumstances does the entity use POD?
3. Which POD technologies does the entity utilise?
4. What are the benefits of using POD technology compared to offset printing?
5. What are the challenges of using POD technology compared to offset printing?
6. What are the cost implications of using POD technology?
7. How is the quality of POD technology compared to offset printing?
8. Why does the entity find POD technology useful or not useful?
9. What POD investments does the entity have?
10. Does the entity have affiliations with POD service providers or entities?
11. Which POD service providers or entities is the entity affiliated with?
12. What are the views of clients about using POD?
13. What are the views of booksellers for books produced by POD technologies?
14. What POD options does the entity offer to authors?

Questions Applicable to **Academic Presses**

1. Does the entity use Print-On-Demand (POD)?
2. In what circumstances does the entity use POD?
3. Which POD technologies does the entity utilise?
4. What are the benefits of using POD technology compared to offset printing?
5. What are the challenges of using POD technology compared to offset printing?
6. What are the cost implications of using POD technology?
7. How is the quality of POD technology compared to offset printing?
8. Why does the entity find POD technology useful or not useful?
9. What POD investments does the entity have?
10. Does the entity have affiliations with POD service providers or entities?
11. Which POD service providers or entities is the entity affiliated with?

Questions Applicable to **University Libraries**

1. Does the entity use Print-On-Demand (POD)?
2. In what circumstances does the entity use POD?
3. Which POD technologies does the entity utilise?
4. What are the benefits of using POD technology compared to offset printing?
5. What are the challenges of using POD technology compared to offset printing?
6. What are the cost implications of using POD technology?
7. How is the quality of POD technology compared to offset printing?
8. Why does the entity find POD technology useful or not useful?
9. What POD investments does the entity have?
10. Does the entity have affiliations with POD service providers or entities?
11. Which POD service providers or entities is the entity affiliated with?

Annexure 4

Clearance Certificate

SCHOOL OF Literature, Language and Media RESEARCH ETHICS COMMITTEE

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: SLLM/M19/10**
PROJECT TITLE	Print-On-Demand in Book Publishing in South Africa for the Past Decade
INVESTIGATOR	**SLLM-M19-10**
SCHOOL/DEPARTMENT	SLLM/ Publishing
DATE CONSIDERED	8 November 2019
DECISION OF THE COMMITTEE	Approved

This ethical clearance is valid for 1 year and may be renewed upon application.

EXPIRY DATE December 2020

ISSUE DATE OF CERTIFICATE November 2019 **CHAIRPERSON**

cc: Supervisor(s) : Colleen Dawson and Rhodé Odendaal

DECLARATION OF INVESTIGATOR

To be completed in duplicate and **ONE COPY** returned to the Chairperson of the School/Department ethics committee.

I fully understand the conditions under which I am are authorized to carry out the abovementioned research and I guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee.

Signature **Date** 18 /11 /2019

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES