Learning Analytics Suggest a Positive Experience: A Descriptive Analysis of a Care and Compassion MOOC (Massive Open Online Course)

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Abstract: Massive Open Online Courses (MOOCs) are a relatively new phenomenon not just in healthcare but also in education as a whole (Sarabia-Cobo et al, 2015; Parkinson, 2015). Their main purpose is to capture the attention of a diverse and global audience in order to increase knowledge through the provision of university level education (Sneddon et al, 2018; Hebdon et al, 2016). The Scottish Improvement Science Collaborating Centre, University of Dundee, developed a care and compassion MOOC hosted by FutureLearn, a digital education platform. This five-week MOOC provided learning resources, activities and information to healthcare professionals and the public in order to help raise awareness and understanding of compassion and improve the provision of compassionate care. A Realistic Evaluation approach was taken which provided an opportunity to utilise mixed methods of data collection thus allowing for the complex nature of the educational intervention to be examined (Pawson and Tilley, 1997). Quantitative data from 957 participants were collected through the MOOCs demographic database and included attrition/retention rates, mechanisms of learning and self-reported impact. In keeping with realistic evaluation, the key components of context, mechanism and outcome were considered throughout analysis. Findings from the quantitative research show potentially promising retention rates with only 8% of enrolees choosing to no longer take part in the course. Of the 957 respondents who completed the pre course survey, 441 (46%) undertook the course to help their career, 311 (32%) to help their academic studies, 349 (36%) for personal reasons and 698 (73%) for social networking (multiple responses were allowed). 94 learners completed the post course survey. Amongst these, 91 respondents rated how the MOOC met their overall needs with 93% providing a positive response and 7% either a negative response or unable to answer. Therefore this paper will discuss a MOOC as a pedagogical approach to teaching the essential and complex healthcare related subject of compassion. It will also consider participants' experiences of learning and the impact this may have on the work practices of healthcare professionals.

Keywords: massive open online course, MOOC, e-learning, pedagogy, care, compassion

1. Introduction

Compassionate care is a vital part of healthcare (Bray *et al* 2014; Mills *et al*, 2015; Dewar and Nolan, 2013; Bridges and Filler, 2014). There are many different definitions of compassion found within the literature. "Understanding or being aware of another person's suffering and acting to end this suffering" (Papadopoulos and Ali, 2016). "Sympathetic pity and concern for the suffering or misfortunes of others" (Oxford Dictionary, 2017). "How care is given based on empathy, respect and dignity, intelligent kindness and central to how people perceive their care" (Department of Health, 2012). However regardless of it's interpretation or understanding it is vital to appreciate that care that is embedded with compassion can produce enhanced results in terms of wellbeing (Steenbergen et al, 2013). Youngson (2012) agree, further affirming that compassionate care provides improved patient satisfaction, enhanced patient safety, savings on time and costs as well as a positive impact on the health and wellbeing of staff and patients. However the quality of patient care within healthcare systems is continuously being called into question (Harrison, 2013; McCrae, 2013). Compassionate care, in particular, has been under scrutiny in the past due to damaging media reports about poor standards of care (Dewar and Nolan, 2013; Harrison, 2013; McCrae, 2013; Price, 2013). And more recently sub standards of care have been brought to the forefront with reports submitted such as The Vale of Leven Hospital Inquiry and The Morecombe Bay Enquiry (MacLean, 2014; Kirkup, 2015). In response The Scottish Improvement Science Collaborating Centre, University of Dundee, developed a Care and Compassion MOOC, using the FutureLearn digital education platform. A team of experts with experience in the field of compassion contributed to the MOOC with either currency of research or educational activity. The five-week course provided learning resources, activities and information to healthcare professionals and the public in order to help raise awareness and understanding of compassion and improve the provision of compassionate care.

Although they have been around since 2008, MOOCs remain a rather novel mode of online education and they are particularly new within healthcare (Sarabia-Cobo et al, 2015; Parkinson, 2015). MOOCs aim to enhance knowledge and understanding using university level teaching. They are directed at a global audience and often include many people from many backgrounds (Sneddon et al, 2018; Hebdon et al, 2016). MOOCS are simply branded as online courses, which often require no formal entry requirements, with no limit to participant numbers and are generally free of charge (Gaebel, 2013). The only real prerequisite is available access to the internet (Turner, 2015; Power and Coulson, 2015). Although many question the authenticity of MOOC learning it is recognised that MOOCs are able to provide genuine learning opportunities (Gaebel, 2013). This form of online learning also promotes discussion and interaction between participants although they do not always have the facility to allow educators to engage with participants (Skiba, 2012). Even though MOOCs were first identified as far back as 2008 they are still very much in their infancy and tentative development stages with a flawless MOOC yet to be developed. There is still much research to be done that could identify elements that may contribute to an exemplary MOOC which with it comes excellent completion rates (Turner, 2015).

2. Method

This study aimed to evaluate a MOOC as a pedagogical approach to teaching the essential and complex healthcare related subject of compassion as well as considering participants experiences of learning and the impact this may have on the work practices of healthcare professionals. Pawson and Tilley's Realistic Evaluation (1997) provided an opportunity for both the measurable aspects of the research as well as the human elements to be considered thus ensuring the complex nature of the MOOC to be examined (Wand et al, 2010; Wong et al, 2012; Hewitt, 2012). This method also allowed for a deeper understanding of what makes the programme work for whom and in what circumstances to be explored (Pawson and Tilley, 1997; Ryecroft-Malone et al, 2010). This process was supported by Wong et al (2008) who suggested that when researching within the field of e-learning, attention must be paid to not only measurement of effectiveness but also investigation into environmental, learner and pedagogical contexts that may enhance or limit successful outcome. According to Sarabia-Cobo et al (2015) it is essential that an evaluation of any new MOOC, which will enhance the provision of material and enrich the learner experience, is undertaken. Realistic evaluation considers a programme through an understanding of the mechanisms it is comprised of, how these mechanisms influence outcomes and the contexts in which the programme is undertaken (Pawson and Tilley, 1997). This Context, Mechanism, Outcome (CMO) configuration permits a comprehensive evaluation of the MOOC (Wand et al, 2010; Dalkin et al, 2015). For this project an initial CMO configuration was proposed which allowed for data to be collected in order to evaluate the programme appropriately:

Context

How and where the MOOC undertaken (country, environment at home/work)

Mechanism

Tools within the MOOC such as discussion boards, learner activities and models for practice

Outcome

Impact relating to attitude, behaviour and practice

Another point of consideration is the use of learning analytics for this research. For this purpose learning analytics are understood to be the digital footprints created by learners, which can be used to understand, improve and optimise the learning experience (Almosallam and Chorfi, 2014)

3. Analysis

Quantitative research was undertaken and created two sets of data. Data set 1 - fundamental demographics and attrition/retention rates. Data set 2 – relating to those who had completed the pre and post MOOC survey for this project. Data relating to the realistic evaluation CMO configuration were then considered.

In terms of sample size - there were more than 3000 learners however only 957 completed the pre course survey either fully or partially (analysis of context), 94 learners completed the post course survey either in full or

partially (analysis of mechanism) and 42 learners fully completed both the pre and post course survey in full (analysis of context and outcome).

4. Results

Demographics – data set 1

Definitions (as described by FutureLearn)
Joiners – the number of enrolments made for the course including educators, admins and learners
Leavers – users who have chosen to no longer be part of the course.
Learners – users who have **viewed** at least one step at any time in any course week (including those who may have gone onto leave).
Active Learners – those who **completed** at least one step at any time in any course week (including those who may have gone onto leave).
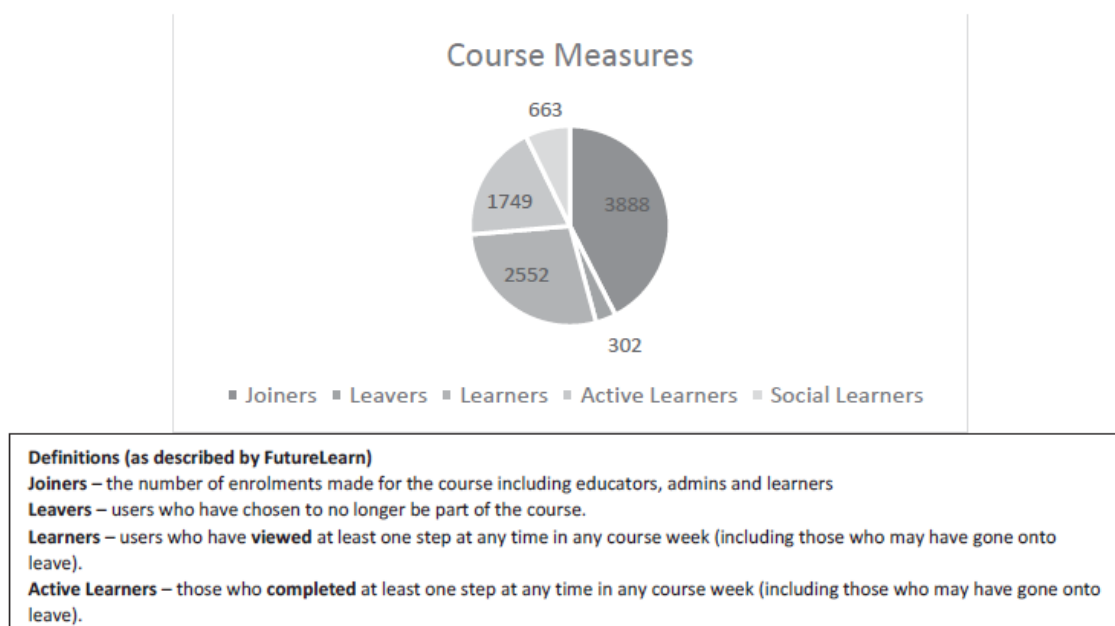
Figure 1: Course measures

Figure 1 shows statistics collected from FutureLearn. This revealed that 3888 individuals had initially registered for the MOOC in week one and by the end of the course 3586 registrants still remained. This shows a potentially promising retention rate, with only 8% of those who enrolled choosing to no longer be part of the course. Of those that remained registered on the course, 1749 (49%) were described as active learners and 663 (18%) as social learners.

Realistic Evaluation Analysis – Data Set 2

5. Context

This analysis was undertaken on respondents who had completed the pre course survey either in full or partially (n=957), this provided varying respondent numbers for each question. This area looked at learners' motivation to participate in the course as well as previous online learning experience. However it is worth noting that respondents were able to select multiple answers for this question therefore showing that many people may have a combination of reasons for undertaking a MOOC.

Table 1: Reason for signing up for the course

To help with job/career	46%	441
To help with academic studies	32%	311
To help for personal reasons	36%	349
To help with social networking	73%	698

Table 1 above shows the numbers of respondents who undertook the MOOC for various reasons and as can be seen from the results that the most popular reason was to help with social networking (73%) which was defined as (share expertise and support with others, socialise with other learners, network with professionals and experts, get feedback and support from others and to learn from others perspectives and experiences).

Table 2: Previously taken a course delivered online?

Yes	61%	553
No	36%	325
Not sure	2%	22

Table 2 shows the majority of respondents (61%) had undertaken some form of online/e-learning prior to the Care and Compassion MOOC.

Table 3: Type of previous online learning taken

Course on FutureLearn	43%	235
Course on a different learning platform	29%	156
Online course for university credit	25%	135
Online continuing professional development or work related course	57%	309
Open learning resource (YouTube, Wikipedia)	31%	170
Other (unspecified)	6%	34

Table 3 shows that just under half (43%) of those who had undertaken previous online learning had done so via the same learning platform, FutureLearn.

The following analysis was undertaken on the respondents who completed the pre and post course questionnaires in full and not partially (n=42).

Gender

The majority of learners on the MOOC (88%) selected their gender as female and 12% selected male as their gender.

Age Range

A wide variety of ages participated in the MOOC from under 18s to over 65s. The highest numbers were concentrated within age ranges 36-65 which totalled 77%, with those 35 and under making up 18% of the total and those over 65 amounting to 5%.

Employment Status

The employment status of learners was represented with the majority (71%) describing themselves as employed, 29% split between the categories of self-employed, unemployed, full-time student or full-time carer.

Where course was undertaken

The highest number of learners (60%) undertook learning within their home environment with the next most popular place being at work (21%). 14% took the course on between a combination of their home and work environments and 2% done it whilst on holiday.

6. Mechanism

The following tables display the analysis which further examines the learning analytics and was undertaken to specifically look at the respondents who completed the post course survey either in full or partially (n=94)

Table 4: Satisfied with the course content

	Yes		No	
Videos and Animations	99%	93	1%	1
Written course content	96%	90	4%	4
Video Subtitles	91%	86	9%	8

Table 4 shows respondents feelings of satisfaction towards 3 key areas of course content. The majority of learners were satisfied with all areas, with only a very small number not satisfied.

Table 5: How engaging were the educators

Very unengaging	2%	2
Fairly unengaging	5%	5
Neither unengaging or engaging	4%	4
Fairly engaging	28%	26
Very engaging	60%	56
Don't know	1%	1

Table 5 demonstrates how engaging the learners felt that the educators were throughout the MOOC. Just under 90% of respondents reacted with a positive response and described the educators as either fairly or very engaging.

Table 6: How easy or difficult did you find the course

Much harder than I wanted	1%	1
Slightly harder than I wanted	4%	4
About the level I wanted	70%	66
Slightly easier than I wanted	13%	12
Much easier than I wanted	11%	10
Not applicable	1%	1

In table 6 the learners were asked to select how easy or difficult they felt the MOOC was in comparison to what they wanted. Just over 70% were happy that the MOOC learning was at the level that they were looking for. Although interestingly approximately 24% thought the course was in some way easier than they would have liked.
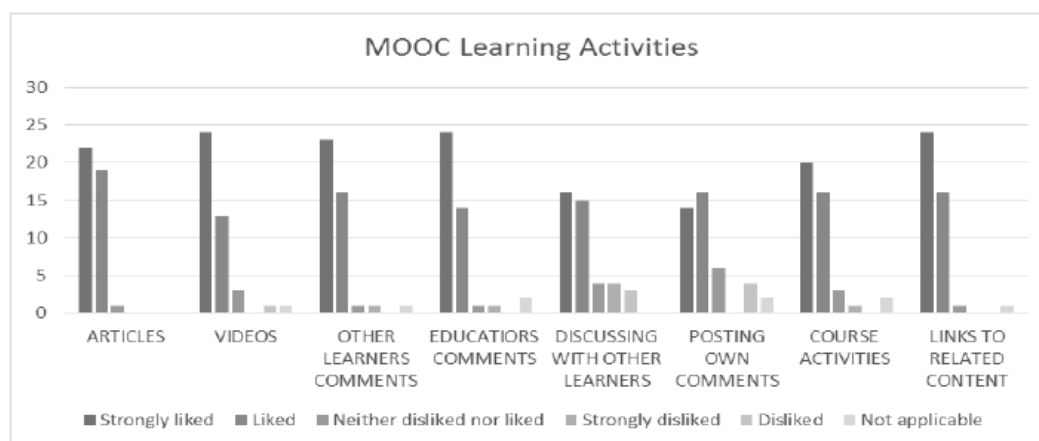

Figure 2: MOOC learning activities

Figure 2 shows the course content/material and the numbers of respondents who like/disliked each form of teaching. As can be seen overall all activities or learning opportunities were either strongly liked or liked by the majority of respondents.

7. Outcome

The outcome analysis was undertaken on the respondents who completed the pre and post course questionnaires in full and not partially (n=42). All of the respondents who completed the post course questionnaire worked within a healthcare setting.
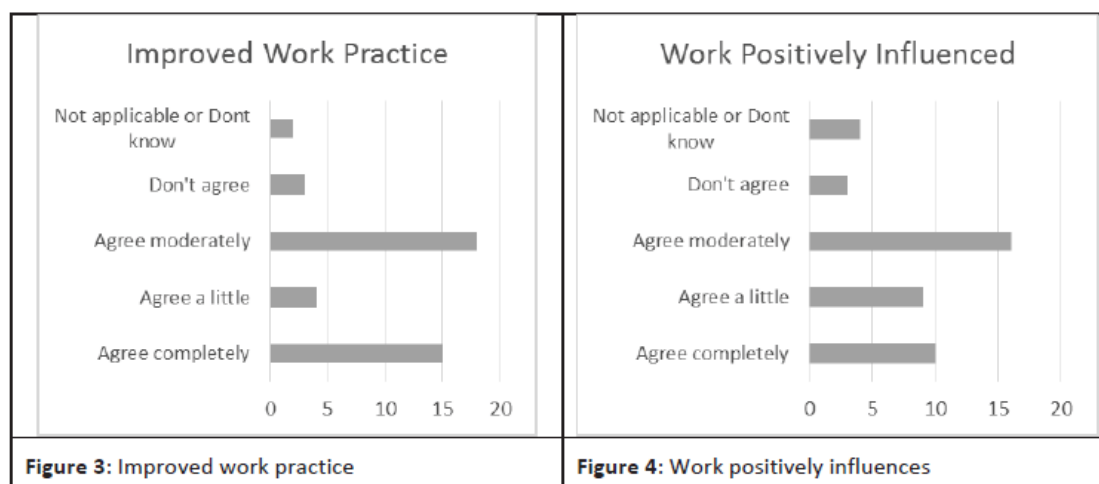

Figure 3: Improved work practice

Figure 4: Work positively influences

The nature and subject of the MOOC meant that this questioning examined improvement and influence directly relating to the provision of compassionate care within work practices. Therefore in terms of the intended outcome figures 3 and 4 illustrate that the majority of learners agreed they could see improved compassionate work practices and a positive influence on their compassionate work ethic following completion of the course.
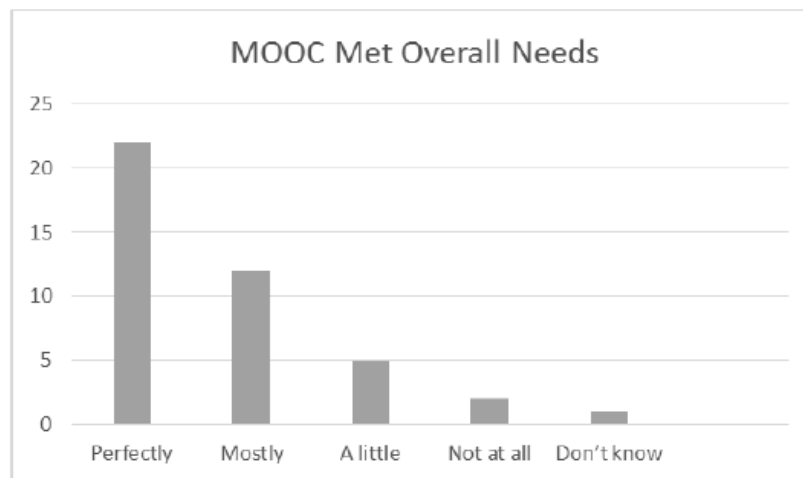

Figure 5: MOOC met overall needs

Figure 5 indicates that 93% of learners described the MOOC as meeting their overall needs either perfectly, mostly or a little and 7% selecting either not at all or don't know as an answer.

8. Discussion

Before discussion begins it is important to gain an understanding of retention, attrition and completion rates as these have been well debated throughout the literature (Jordan, 2015). To add complexity to these debates these terms are frequently defined and interpreted very differently (Gutl et al, 2014). Completion rates, often understood as the number of learners who obtained a certificate of completion (Jordan 2015), can conversely be understood as the number of learners who have met their own personal aims (Huin et al, 2016). Hone and Said (2016) implied in their research that retention rates showed the number of learners who have stayed until the end of the course. Put another way it can be the number of learners on the course who simply had the intention to complete (Gutl et al, 2014). In some literature attrition is outlined as the reduction in the number of learners from enrolment to the end (Gutl et al, 2014). However drop out can also be interpreted as the number of learners who have physically unregistered from the course. It is this confusion that creates challenges and complexity with the evaluation of MOOCs. Nonetheless it is important to consider these elements in order to understand learner actions and practices and to evaluate learning experience (Huin et al, 2016)

The findings from the Care and Compassion MOOC showed that only 8% of enrolled learners chose to no longer be part of the course. Although unable to examine specifically why those 8% left this MOOC, as they did not complete the post-course survey, some literature suggests that reasons for leaving can be; no real intention to complete, lack of time or skills, course difficulty and bad experiences (Gutl et al, 2014; Jordan, 2015; Onah, Sinclair and Boyatt, 2014). Because only 8% chose to no longer be part of the course, some literature suggests this then leaves what could be interpreted as a retention rate of 92% (Gutl et al, 2014; Hone and Said 2016). This is a very high number for a MOOC of today with much of the literature and concern detailing drop-out rates of between 10% and 20% (Gutl et al, 2014; Onah, Sinclair and Boyatt, 2014). However it could be argued that although only 8% left it does not mean that 92% of learners remained engaged throughout the MOOC. One observation that can be made when considering such a high retention rate is the learners intention to complete or in fact lack thereof. Some literature discusses retention as including those learners that only have the intention to complete when they enrol (Gutl et al, 2014). However other literature conversely suggests that high enrolment numbers can often include those with no real intention to complete which is also possible because MOOCs are free with no commitment and often attract those with an inquisitive nature rather than those wishing to genuinely enhance their knowledge. Nevertheless, as with those that left, it is impossible to measure whether the 92% of retained learners actually had the intention to complete or not but perhaps it should be considered that because learners are able to delve in and out of the course in order to satisfy their own aims and needs they can gain from the content of a MOOC without actually completing it. Drop out,

attrition or non-completion rates need not always be looked upon as negative but rather that the learner has the flexibility to stop learning once they have satisfied their own personal goals and achieved their aims (Huin et al, 2016). The low number of "leavers" in the Care and Compassion MOOC shows that something within or about the MOOC, be it the course content, subject matter, learner interaction or engagement, caught the attention of the learners and although 92% of learners may not have physically completed it, they may have taken from it what they needed and therefore have been retained (Huin et al, 2016).

Looking at individual reasons for enrolling on a MOOC and personal aims for "completion" it can be appreciated that learners enrol on MOOCS for many different reasons (Gaebel, 2013). Some register because they are interested in the main subject matter, some to improve their skills in a particular area and some may even be undertaking the learning in order to gain employment in a specific area and are looking to obtain a certificate of completion (Huin et al, 2016; Jordan 2015; Onah, Sinclair and Boyatt, 2014). When considering completion etc. it is vital that the purpose of enrolling on the MOOC from a learner perspective is considered because they might have gained what they needed before the point of completion whilst finding the MOOC useful and informative as could be interpreted in the Care and Compassion MOOC (Huin et al, 2016). The results of this research showed that the most popular reason for signing up was for social networking purposes which is defined as, sharing expertise and support with others, socialising with other learners, networking with professionals and experts, getting feedback and support from others and learning from others perspectives and experiences.

Now examining the course content as a driving force behind retention, it is evident that in some cases the low number of learners choosing to leave the course may be attributable to the course content which, looking at the results, appears to have been reviewed positively. Of the 94 respondents who fully completed the post course survey, answering questions in relation to how they felt about the course content, most were satisfied with video and animation content, written course content as well as video subtitles. Examining this further and looking in more detail at the activities that were liked/disliked by learners, it is clearly evident that all forms of learning (articles, videos, other learner comments, educator comments, discussions, posting own comments, course activities and related links) were all predominantly either strongly liked or liked. Along with this nearly 80% of post course survey respondents found the educators engaging throughout the MOOC which again may contribute to the retention rates. Some literature does suggest that successful completion rates can be facilitated by ensuring that students are well supported by the educational team (Gutl et al, 2014). Onah, Sinclair and Boyatt (2014) discussed this in their paper which looked at course not only the support offered throughout the course but also its ease or difficulty. The findings from the care and compassion MOOC showed that just over 70% of learners felt that the courses educational level met their expectations. Regardless of these variances it is evident that as a basic framework all MOOCs should have an evident start and finish point as well as containing regular milestones, flagstones or check points that will assess participants learning so far (Turner, 2015).

The findings in terms of changes to work practices appears to be overall positive. Self-reported data showed that the majority agreed that their work practices had improved as a result of the course. As well as this more learners agreed that their work had been positively influenced after completing the MOOC than not. The subject matter of the course meant that this data directly related to the provision of care that is embedded with compassion. Although it is worth noting that this questioning did not allow respondents to specify whether this improvement and positive influence in compassionate care was relevant to them as an individual or if it extended out to their working environment. Nonetheless we know from previous literature that a compassionate care environment can have a positive impact on patient and staff wellbeing (Steenbergen et al, 2013; Youngson, 2012)

In terms of having an overall positive experience with the Care and Compassion MOOC, the initial findings show that not only were 92% of learners retained with hopefully the majority of these taking from it what they wanted or needed but also out of the number of learners asked specifically if the course met their overall needs, the majority had a positive response.

However it must be noted that this research is not without its limitations and has a significantly smaller sample size than that normally offered from quantitative data particularly in the measurement of overall experience. This is because it was taken from the 42 respondents who completed the post course survey in full rather than the 3586 learners who remained registered at the end of the course. This small number was due to the research requesting that only Healthcare Practitioners complete the survey at the end of the course.

9. Conclusion

The learning analytics suggest that this Care and Compassion MOOC has been received positively amongst learners with many elements of the course proving to be popular and successful. However further testing of the hypothesis is required in order to strengthen the empirical element of this research. Further to this, although this research in part was aimed at examining the MOOC in more detail and its learning analytic successes and limitations, it is also for the purpose of examining in more detail the possible impact on healthcare professionals compassionate working practices. In keeping with the sequential nature of this larger research project, the results of the above quantitative analysis will be utilised in order to develop appropriate coding for qualitative data gathered from telephone interviews with MOOC learners at the end of the course. This will allow for a more in depth examination of motivation to complete, successful retention and individual learning experiences. The overall findings from the whole research project will be used to inform educators, healthcare leaders and practitioners of the usefulness of using a MOOC to learn about compassionate care. They will also be utilised to suggest and inform prospective future research in the areas of e-learning and care and compassion.

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