



## Research article

# A quantitative study examining infographic assessment guidelines for undergraduate nursing students with specific learning difficulties (SpLDs)

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## ARTICLE INFO

## Keywords:

Inclusivity

Infographic

Specific learning difficulties (SpLD)

Universal Design for Learning (UDL)

## ABSTRACT

This research investigates the perceived clarity and usefulness of infographic versus traditional text-based assessment guidelines among undergraduate nursing students with and without specific learning difficulties (SpLDs). Through quantitative analysis, the study reveals that undergraduate nursing students with SpLDs significantly prefer infographics over text-based guidelines, both in terms of clarity and usefulness ( $p < .001$ ). Interestingly, there were no statistically significant differences in the perceptions of students without SpLDs. These findings suggest that the use of infographics as a tool for presenting assessment guidelines could contribute to more inclusive educational practices. The research further highlights the potential of infographics to not only make complex information more accessible but also to cater to diverse learning needs. As higher education institutions strive to be more inclusive, adapting assessment guidelines to suit the varied learning styles and cognitive needs of all students, particularly those with SpLDs, becomes increasingly important. This paper provides initial evidence to support the adoption of infographic-based assessment guidelines as a step towards achieving this goal.

## 1. Introduction

In the 2021/22 academic year, there were approximately 110,000 undergraduate students with a specific learning difficulty in the United Kingdom (UK), representing 6.2% of all undergraduate students (HESA, 2023). The term “specific learning difficulty” encompasses specific disabilities as well as neurodiversity such as dyspraxia, dyscalculia, autism, and attention deficit (hyperactivity) disorder (Cowen, 2010). Students with SpLDs can experience challenges in processing and retaining information, organising their thoughts, time management, note-taking, writing assignments, sitting exams, and may also struggle with self-esteem and anxiety issues (Mortimore and Crozier, 2006; Jacobs et al., 2022).

In higher education, supporting students with SpLDs is a growing priority, especially as the number of students with SpLDs is increasing (HESA, 2023). One area that has received little attention is how information is presented to students, in particular the use of infographics. One definition of an infographic is “a larger graphic design that combines data visualizations, illustrations, text, and images together into a format that tells a complete story” (Krum, 2014). According to Chicca and Chunta

(2020), infographics are particularly useful as a teaching and learning strategy because of their potential for “*explanatory power*”. Infographics aid comprehension, recall, and may support readers to engage with topics such as research (Hughes et al., 2021). In higher education, infographics have been used for learning, teaching, and assessment (Hsiao et al., 2019; Jaleniauskiene and Kasperiumiene, 2022). However, there is limited literature on the use of infographics to provide assessment information to students.

Assessment guidelines are explicit criteria provided by educators to students that outline the specific requirements for the assignment, the structure or format to be followed, and the criteria against which the work will be evaluated (Biggs and Tang, 2011). In higher education, assessment guidelines are instrumental for constructive alignment, a central principle in contemporary educational design (Biggs and Tang, 2011). This principle posits that all aspects of instruction – learning outcomes, activities, and assessment – should be aligned to support the learning process. Assessment guidelines serve as a pathway, setting out expectations and standards for students to follow and achieve their learning objectives. They contribute to the demystification of the academic standards, transforming abstract competencies into tangible and

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actionable components, reducing student anxieties around assessments, and encouraging them to focus their efforts productively towards achieving learning outcomes (Sadler, 2005; Balan and Jönsson, 2018).

Students' motivations are often driven by assessments (Cilliers et al., 2010). However, they often find it difficult to decode assessment guidelines (Carless, 2006; Rust et al., 2003), and express frustration about the applicability of assessment guidelines which they deem to be written 'generically' (Graham et al., 2022). Finding a balanced approach to crafting assessment guidelines is key to appropriate assessment (Worth, 2014). Guideline five of the UK Quality Code for Higher Education: Assessment suggests that "Assessment is explicit and transparent" and that "Students are clearly informed of the purpose and requirements of each assessment task and the standards expected" (The Quality Assurance Agency for Higher Education, 2018). Effective assessment guidelines should meet students' needs, providing students with explicit expectations and a clear path for their learning process (Brookhart and Nitko, 2018). In line with the principles of inclusive education, clear presentation of assessment guidelines caters to the diverse learning needs of students and ensures that all students have an equal opportunity to understand what is expected of them (Fuller et al., 2004).

Assessment guidelines are typically text. It is unclear whether this format adequately caters to the needs of students with SpLDs or fits with the principles of Universal Design for Learning (UDL), necessitating the exploration of alternatives, such as infographic assessment guidelines. There is a lack of evidence investigating the potential benefits of infographics for assessment guidelines. To address this knowledge gap, a study was conducted to explore the perception of infographic assessment guidelines by students with SpLDs.

## 2. Methods

### 2.1. Ethics

Ethics approval was granted by the Chair of the Humanities, Social and Health Sciences Research Ethics Panel on 16/03/23 (application number: E1062).

### 2.2. Setting

The setting for this study was a University in the North of England. Undergraduate nursing students ( $n = 330$ ) on a second-year theory module were provided with both text guidelines and infographic guidelines when the module began and were free to choose which to use. An infographic version of the assessment guidelines was devised (Fig. 1, Supplementary material). Adobe Photoshop CC 19.1.7 2018 was used to create the infographic.

### 2.3. Data collection

Data collection took place in June 2023. All students ( $n = 330$ ) who were completing a second-year undergraduate nursing module were approached to complete the questionnaire. The questionnaire was provided using Microsoft Forms. A QR code that linked to the questionnaire was displayed on TV screens in seminars, and an email was sent to the student group. Data collection took place before the assessment submission.

### 2.4. Data analysis

Data analysis was conducted using IBM SPSS Statistics for Windows, Version 28.0. Paired samples  $t$ -tests were used to compare the perceived usefulness and clarity of text guidelines versus infographic guidelines among students with and without an SpLD. Independent samples  $t$ -tests were performed to compare the ratings of the assessment guidelines by students with and without an SpLD. Hedges'  $g$  values were calculated to identify effect sizes.

## 3. Results

### 3.1. Response rate

The questionnaire was sent to 330 students and received 127 responses (a response rate of 38.4 %). Of the 330 students, 73 had a declared SpLD (22.1 %). 38 responses from students with an SpLD were received (a response rate of 52.1 % for this subgroup). Three respondents were excluded from the analysis: two students expressed uncertainty about their SpLD status, while one preferred not to answer.

### 3.2. Students with an SpLD

Students with an SpLD rated the usefulness of the infographic guidelines as  $8.57 \pm 1.54$  and the usefulness of the text guidelines as  $7.24 \pm 2.11$  (Table 1, Fig. 1). There was a statistically significant preference for infographic guidelines over text guidelines,  $p < .001$  (two-sided) (Table 2). Hedges'  $g$  was  $-0.575$  for the usefulness of the infographic guidelines compared to the text guidelines for students with an SpLD (Table 3).

Students with an SpLD rated the clarity of the infographic guidelines as  $8.68 \pm 1.34$  and the clarity of the text guidelines as  $7.11 \pm 2.26$  (Table 1, Fig. 1). This difference was also statistically significant,  $p < .001$  (two-sided) (Table 2). Hedges'  $g$  was  $-0.575$  for the clarity of the infographic guidelines compared to the text guidelines for students with an SpLD (Table 3).

### 3.3. Students without an SpLD

Students without an SpLD rated the usefulness of the infographic guidelines as  $7.44 \pm 1.83$  and the usefulness of the text guidelines as  $7.46 \pm 2.12$  (Table 1). This difference was not statistically significant,  $p < .961$  (two-sided) (Table 2). Hedges'  $g$  was  $0.005$  for the usefulness of the infographic guidelines compared to the text guidelines for students without an SpLD (Table 3).

Students without an SpLD rated the clarity of the infographic guidelines as  $7.35 \pm 1.97$  and the clarity of the text guidelines as  $7.49 \pm 1.90$  (Table 1). This difference was also statistically significant,  $p < .462$  (two-sided) (Table 2). Hedges'  $g$  was  $-0.080$  for the clarity of the infographic guidelines compared to the text guidelines for students with an SpLD (Table 3).

### 3.4. Infographic guideline rating

Students with an SpLD rated the usefulness of the infographic guidelines as  $8.57 \pm 1.54$  compared to a rating of  $7.44 \pm 1.83$  for students without an SpLD (Table 1). The  $t$ -test assuming equal variances gave a two-sided  $p$  of  $<0.001$ , indicating a statistically significant

**Table 1**

Ratings of usefulness and clarity for assessment guideline format for students with and without an SpLD.

Question	Rating		
	Overall	No SpLD	SpLD
On a scale of 1–10 (with 10 the most useful) how useful do you think the image-based guidelines were to you?	$7.78 \pm 1.82$ ( $n = 122$ )	$7.44 \pm 1.83$ ( $n = 85$ )	$8.57 \pm 1.54$ ( $n = 37$ )
On a scale of 1–10 (with 10 the most clear) how clear do you think the image-based guidelines were to you?	$7.76 \pm 1.90$ ( $n = 123$ )	$7.35 \pm 1.97$ ( $n = 85$ )	$8.68 \pm 1.34$ ( $n = 38$ )
On a scale of 1–10 (with 10 the most useful) how useful do you think the text-based guidelines were to you?	$7.39 \pm 2.11$ ( $n = 123$ )	$7.46 \pm 2.12$ ( $n = 85$ )	$7.24 \pm 2.11$ ( $n = 38$ )
On a scale of 1–10 (with 10 the most clear) how clear do you think the text-based guidelines were to you?	$7.37 \pm 2.01$ ( $n = 124$ )	$7.49 \pm 1.90$ ( $n = 86$ )	$7.11 \pm 2.26$ ( $n = 38$ )

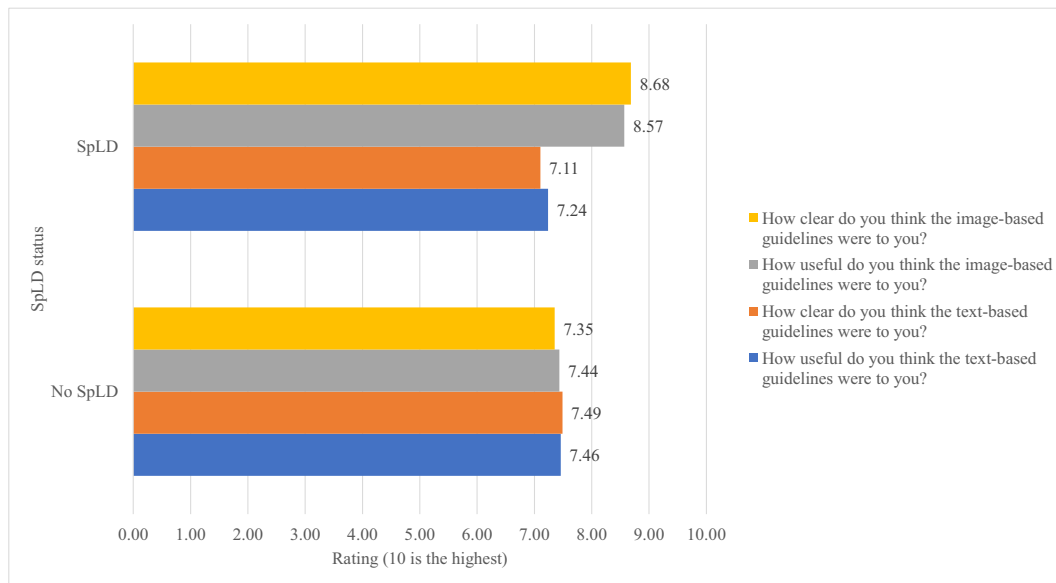


Fig. 1. Ratings of usefulness and clarity for assessment guideline format.

Table 2  
Paired t-tests to compare ratings of usefulness and clarity for students with and without an SpLD.

Pair	Mean	Std. deviation	Std. error mean	95 % confidence interval of the difference		T	df	Significance	
				Lower	Upper			One-sided p	Two-sided p
No SpLD Text vs. infographic usefulness	0.01190	2.23064	0.24338	-0.47217	0.49598	0.049	83	0.481	0.961
No SpLD Text vs. infographic clarity	0.14118	1.76036	0.19094	-0.23853	0.52088	0.739	84	0.231	0.462
SpLD Text vs. infographic usefulness	-1.29730	2.23439	0.36733	-2.04228	0.55232	-3.532	36	<0.001	0.001
SpLD Text vs. infographic clarity	-1.57895	2.61629	0.42442	-2.43890	0.71900	-3.720	37	<0.001	<0.001

Table 3  
Hedges' correction to compare ratings of usefulness and clarity for students with and without an SpLD.

Pair	Standardiser	Point estimate	95 % confidence interval	
			Lower	Upper
No SpLD text vs. infographic usefulness	2.24078	0.005	-0.208	0.218
No SpLD text vs. infographic clarity	1.76827	0.080	-0.132	0.292
SpLD text vs. infographic usefulness	2.25801	-0.575	-0.916	-0.226
SpLD text vs. infographic clarity	2.64318	-0.597	-0.937	-0.251

difference (Table 4). Hedges' g was -0.644 (Table 5).

Students with an SpLD rated the clarity of the infographic guidelines as  $8.68 \pm 1.34$  compared to a rating of  $7.35 \pm 1.97$  for students without an SpLD (Table 1). The t-test assuming equal variances gave a two-sided p of <0.001, indicating a statistically significant difference (Table 4). Hedges' g was -0.734 (Table 5).

### 3.5. Text guideline rating

Students with an SpLD rated the clarity of the text guidelines as  $7.24 \pm 2.11$  compared to a rating of  $7.46 \pm 2.12$  for students without an SpLD (Table 1). The t-test assuming equal variances gave a two-sided p of <0.593, indicating there was no statistically significant difference (Table 4). Hedges' g was -0.104 (Table 5).

Students with an SpLD rated the clarity of the infographic guidelines

as  $7.11 \pm 2.26$  compared to a rating of  $7.49 \pm 1.90$  for students without an SpLD (Table 1). The t-test assuming equal variances gave a two-sided p of <0.331, indicating there was no statistically significant difference (Table 4). Hedges' g was -0.189 (Table 5).

### 3.6. Student preference for assessment guideline format

Students were asked which guidelines they would prefer to use in future (infographic, text, or a combination of both) (Fig. 2). Overall (n = 127), 74 students preferred to use a combination of both, 37 students preferred to use infographic guidelines, and 16 students preferred to use text guidelines. For students with an SpLD (n = 38), 21 preferred to use a combination of both, 15 preferred to use infographic guidelines, and 2 preferred to use a combination of both. For students without an SpLD (n = 86), 50 preferred to use a combination of both, 22 preferred infographic guidelines, and 14 preferred text guidelines.

## 4. Discussion

### 4.1. Response rate

A total of 330 students taking the module were sent a link to the questionnaire; 73 of these 330 students had a Specific Learning Difficulty (SpLD). A total of 127 responses were received (response rate of 38.4 %): 38 responses from students with SpLDs were received (response rate of 52.1 %). This relatively higher response rate from students with SpLDs may indicate a heightened interest in the topic of assessment guidelines, providing a valuable perspective for this study.

**Table 4**  
Independent samples t-tests to compare ratings of usefulness and clarity for students with and without an SpLD.

Question	Equal variances assumed or not assumed	F	Sig.	t	df	Significance		Mean difference	Std. error difference	95 % confidence interval of the upper	
						One-sided p	Two-sided p			Lower	Upper
Text useful SpLD vs. non SpLD	Equal variances assumed	0.179	0.673	0.536	121	0.296	0.593	0.22198	0.41376	-0.59716	1.04113
	Equal variances not assumed			0.538	71.625	0.296	0.592	0.22198	0.41274	-0.60088	1.04484
Text clear SpLD vs. non SpLD	Equal variances assumed	3.038	0.084	0.976	122	0.165	0.331	0.38311	0.39239	-0.39367	1.15989
	Equal variances not assumed			0.912	60.941	0.183	0.366	0.38311	0.42027	-0.45729	1.22351
Image useful SpLD vs. non SpLD	Equal variances assumed	1.669	0.199	-3.292	120	<0.001	0.001	-1.13227	0.34396	-1.81329	-0.45126
	Equal variances not assumed			-3.524	80.856	<0.001	<0.001	-1.13227	0.32127	-1.77152	-0.49303
Image clear SpLD vs. non SpLD	Equal variances assumed	7.821	0.006	-3.782	121	<0.001	<0.001	-1.33127	0.35196	-2.02808	-0.63446
	Equal variances not assumed			-4.367	101.676	<0.001	<0.001	-1.33127	0.30487	-1.93601	-0.72653

**Table 5**  
Hedges' correction to compare ratings of usefulness and clarity for students with and without an SpLD.

Pair	Standardiser	Point estimate	95 % confidence interval	
			Lower	Upper
No SpLD vs. SpLD text useful	2.13355	0.104	-0.276	0.484
No SpLD vs. SpLD text clear	2.02692	0.189	-0.192	0.569
No SpLD vs. SpLD infographic useful	1.75738	-0.644	-1.035	-0.251
No SpLD vs. SpLD infographic clear	1.81491	-0.734	-1.123	-0.341

4.2. Infographic design

Students were provided with both text guidelines and infographic guidelines, and were free to use either, or a combination of both, during the module. The text on the infographic guidelines was identical to the text guidelines. The infographic used in this study was relatively basic (Fig. 1, Supplementary material) and consisted of two sides of A4. The infographic guidelines used a one-colour scheme, limited pictures, and some flowchart elements (e.g., organisational boxes and arrows). A light

background with dark text and graphics is suggested to be easier to read than light text on a dark background (Richardson et al., 2014). The use of flowchart elements is recommended to demonstrate sequential progression (Dunlap and Lowenthal, 2016). In this infographic, they were used to suggest a structure to students, and a methodical manner in which the work could be approached. The scaffolding theory implies that presenting information in a step-by-step temporal framework can guide the learner through the material, building understanding gradually (Baker, 2010). Several guidelines exist for the creation of effective infographics and in future co-creation could take place with students (Krum, 2014; Dunlap and Lowenthal, 2016; Hernandez-Sanchez et al., 2021).

4.3. Preference of students with an SpLD

The data indicates a significant preference among students with an SpLD for infographic guidelines compared to text guidelines. Usefulness of the infographic guidelines was rated as higher ( $8.57 \pm 1.54$ ) than the text guidelines ( $7.24 \pm 2.11$ ) (Table 1). This was statistically significant with a  $p$ -value of  $<0.001$  (two-sided) (Table 2). The effect size (Hedges'  $g$ ) was  $-0.575$ , indicating a moderate to large effect (Table 3). Clarity of the infographic guidelines was also rated as higher ( $8.68 \pm 1.34$ ) than the text guidelines ( $7.11 \pm 2.26$ ). This difference was statistically

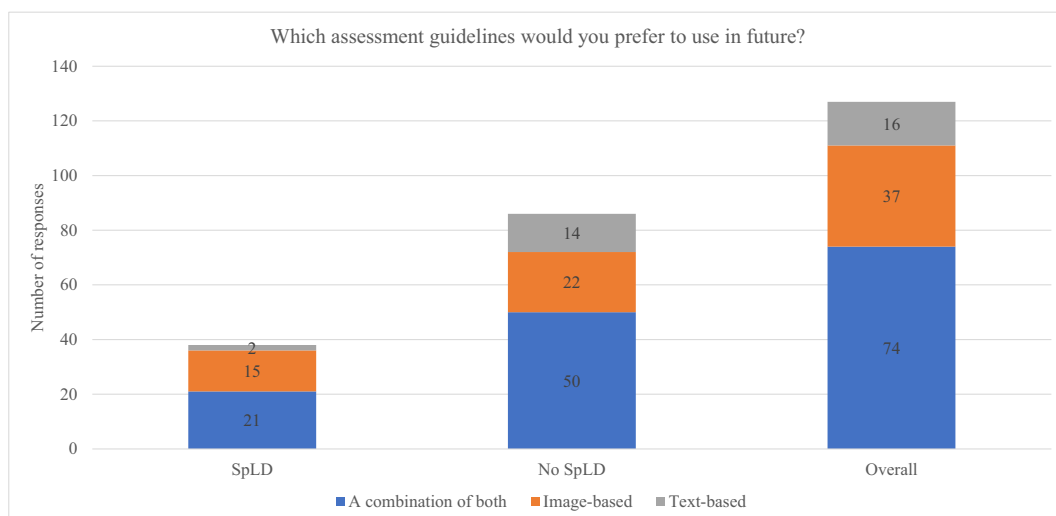


Fig. 2. Student preference for assessment guideline format.

significant as measured with a  $p$ -value of  $<0.001$  (two-sided) (Table 2) and Hedges'  $g$  of  $-0.597$  (Table 3).

Contrastingly, students without an SpLD displayed no significant difference in their preference for one type of guideline over the other. Their ratings for the usefulness of both infographic ( $7.44 \pm 1.83$ ) and text guidelines ( $7.46 \pm 2.12$ ) were almost identical (Table 1), reflected by a high  $p$ -value of  $0.961$  (two-sided) (Table 2). The effect size was minute, with Hedges'  $g$  being  $0.005$  (Table 3). Similarly, for the clarity of guidelines, the two formats were rated closely with  $7.35 \pm 1.97$  for infographic guidelines and  $7.49 \pm 1.90$  for text guidelines (Table 1), with a  $p$ -value of  $0.462$  (two-sided) (Table 2) and a Hedges'  $g$  of  $-0.080$  (Table 3), underscoring the lack of a clear preference among students without an SpLD.

When directly comparing students' ratings with and without an SpLD, a distinctive trend emerged for the infographic guidelines. Students with an SpLD rated the usefulness and clarity of these guidelines higher than their non-SpLD counterparts. The independent samples  $t$ -tests, assuming equal variances, showed a two-sided  $p$ -value of  $<0.001$  for both (Table 4), with Hedges'  $g$  effect sizes of  $-0.644$  and  $-0.734$  respectively (Table 5). This emphasises a clear divergence in the perceptions between the two groups.

However, for the text guidelines, there was no statistically significant difference in the clarity ratings between students with an SpLD ( $7.24 \pm 2.11$ ) and those without ( $7.46 \pm 2.12$ ) (Table 1), with a  $p$ -value of  $0.593$  (two-sided) (Table 4) and a Hedges'  $g$  of  $-0.104$  (Table 5). The ratings for the clarity of text guidelines also did not vary significantly, with a  $p$ -value of  $0.331$  (two-sided) (Table 4) and a Hedges'  $g$  of  $-0.189$  (Table 5).

The data indicate a clear preference for infographic guidelines for students with an SpLD. Infographic guidelines offer another way of representing information that may meet the needs of students with SpLDs, especially as assessments in higher education have often not been able to meet the needs of students with SpLDs (Nieminen, 2022; Fuller et al., 2004). The personalised support for students with SpLDs can be logistically challenging in the context of large student numbers. For instance, in this module where 73 students had an SpLD, providing even 15 minutes of one-to-one time with each student would necessitate a significant investment of time and resources. Consequently, finding effective strategies to bridge the gap and promote inclusivity is a priority. Other interventions such as embedding study skills into modules or supplementary lecture recording are reportedly beneficial for students with SpLDs (Wray et al., 2013; Nightingale et al., 2019). The use of infographic guidelines could potentially be a complementary approach. Interestingly, students without an SpLD demonstrated no significant preference between the two types of guidelines. This suggests that, while visual aids like infographics might be helpful for certain learners (like those with an SpLD), they might not offer a pronounced advantage for everyone. However, this cannot be definitively determined from the current study as the impact on students' attainment was not quantified.

Most students preferred to use a combination of both guidelines in their work (Fig. 2). Some studies have suggested that information from infographics is more likely to be retained than that from text alone (Murray et al., 2017) and learners reportedly retain more information from the use of images alongside text (Mayer et al., 1996; Cuevas et al., 2002). Incorporating elements of both types of guidelines could potentially lead to a more inclusive and effective learning environment for all students. This aligns with one of the principles of Universal Design for Learning (UDL), which encourages the use of multiple means of representation to cater to diverse learners (Center for Applied Special Technology (CAST), 2018). Some students with SpLDs may have challenges engaging in creative or lateral thinking due to the way they process information (Roberts and Roberts, 2015). The chunking principle advocates for organising information into discrete, manageable sections to reduce cognitive load (Baker, 2010). The visual nature of infographics breaks down complex ideas into digestible, visually appealing chunks, which aids comprehension (Yau, 2015) and can reportedly reduce

cognitive load (Martin et al., 2019).

The students in this study were all undergraduate nursing students in the UK. The use of digital infographics may be particularly relevant to this group. Section 1.7 of the Nursing and Midwifery (NMC)'s Part 3: Standards for Pre-registration Nursing Programmes states that educational institutions must "support students throughout the programme in continuously developing their abilities in numeracy, literacy, digital and technological literacy to meet programme outcomes" (Nursing and Midwifery Council, 2018). Health Education England (HEE) defines digital literacy as "the capabilities which fit someone for living, learning, working, participating and thriving in a digital society" (Health Education England, n.d.). Digital literacy goes beyond mere computer proficiency and involves a deeper understanding of digital environments and their social, cultural, and ethical contexts. In this context, the ability to comprehend and critically evaluate digital media forms, such as infographics, forms an integral part of digital literacy. Infographics are widely and increasingly used to communicate information on social media (Toth, 2013), disseminate scientific literature (Millar and Lim, 2022; Ramos and Concepcion, 2020), and share public health information (Scott et al., 2016). Students must be equipped with the skills to discern the reliability and relevance of the data presented in these media forms. An increased integration of infographics into the curriculum could help to equip nursing students with the necessary skills to navigate the digital information landscape confidently and efficiently. Additionally, the proportion of students with an SpLD (22.1 %) in this study is greater than the reported statistics for higher education as a whole (6.2 % for the most recent year of reported statistics, 2021/22) (HESA, 2023).

It is unclear why there is a higher proportion of nursing students with SpLDs compared to the sector as a whole. The higher incidence of SpLDs in nursing students could suggest that the nursing attracts individuals with diverse cognitive styles and learning approaches, or it could reflect that the higher education institution is more proactive or effective in identifying and supporting students with SpLDs, or even that the nursing education community may foster an environment where students feel more comfortable disclosing their SpLDs. Regardless of the reason for the increased incidence, the higher rate of SpLDs among nursing students necessitates a re-evaluation of teaching and learning methods.

Infographics have found utility in other areas of higher education. Alqudah et al. (2019) concluded that presenting lecture material in infographics increased students' perception and positively affected their interaction. The use of infographics as a learning tool and an assessment for students in higher education has been well-reviewed and their inclusion often leads to improved student outcomes (Jaleniauskienė and Kasperuniene, 2022). This study adds to the growing body of literature on the use of infographics in higher education.

#### 4.4. Limitations

The study did not quantify the direct impact of infographics on students' grades. However, it suggests that infographics could enhance the efficiency of learning, enabling students to reach similar levels of comprehension more quickly. A focus solely on grades misses a more holistic understanding of the educational experience.

The assessment for this module was a group presentation. It is possible that some group members may have had a greater understanding of the guidelines, which could have compensated for students who did not fully understand the assessment guidelines. However, students who have a clear understanding of guidelines can play a pivotal role in aiding their peers. This peer-assisted learning not only benefits those who receive guidance but also offers a metacognitive advantage to the ones who provide it. As highlighted by Stigmar (2016), teaching or explaining concepts to peers can further enhance the understanding and cognitive processing of the student providing the explanation (Stigmar, 2016). Even if some students initially lacked clarity about the guidelines, the collaborative nature of group work might have facilitated a

shared learning experience, promoting a deeper understanding among all group members.

While 127 responses were collected, this only represented 39.4 % of all students who were provided with the assessment guidelines. 38 responses from students with an SpLD were received, equating to a 52.1 % response rate from this subgroup. The conclusions drawn about this group might not be representative of the broader population of students and larger sample sizes could provide more robust conclusions. However, this study provides an important starting perspective, especially as the proportion of students with an SpLD (22.1 %) in this study is greater than the reported statistics for higher education as a whole (6.2 % for the most recent year of reported statistics, 2021/22) (HESA, 2023).

This study may not have captured all students with an SpLD. Students are not required to disclose a SpLD at entry to education and may therefore choose not to do so for various reasons (Wray et al., 2012; Roberts and Mitchell, 2005). One study that sampled Local Education Agencies (LEA) in the United States of America (USA) identified that for students attending a postsecondary school, 7.8 % with a learning disability, 8.6 % with a speech/language impairment, 16.2 % with an emotional disturbance, and 14.2 % with autism did not declare it to their school (Newman et al., 2009).

The study relied on self-reported responses from students. It may have been evident that this research was comparing infographic and text assessment guidelines. Therefore, this could have introduced bias as students may have given perceived desirable answers or their perceptions may not have reflected their true understanding or use of the guidelines. Additionally, data collection took place before the assessment, marking, and feedback. Students may have rated the guidelines differently if they had seen the effect that they had on their performance.

Without a control group of students who were given no specific guidelines, or without dividing the students into two study groups (text vs. infographic), it is hard to quantify the effect of the guidelines themselves. As students' understanding and usage of guidelines may evolve over time with more exposure and experience, longitudinal data could provide a more comprehensive picture.

However, despite these limitations, this study is an important exploration into the utility of infographic assessment guidelines. This work contributes to the growing body of evidence supporting the use of visually enhanced pedagogical tools. It offers an important starting point from which future research can refine the use of infographic guidelines and further explore their efficacy. Understanding the target audience is key to effective infographic design (Hernandez-Sanchez et al., 2021). Therefore, future work could focus on co-creation of assessment guidelines with students.

## 5. Conclusions

The purpose of this paper was to stimulate debate about the use of infographics to deliver information about assessment guidelines, with a particular focus on those with specific learning difficulties (SpLDs). The results suggest that students with SpLDs find infographic guidelines clearer and more useful compared to text guidelines. Furthermore, most students, regardless of their SpLD status, expressed a preference for using a combination of both types of guidelines in the future.

This study underscores the importance of implementing inclusive strategies in teaching and assessment practices. In the context of increasing class sizes and diversity, the use of innovative, accessible, and inclusive assessment guidelines, such as infographics, can play a crucial role in meeting the varying needs of all students, particularly those with SpLDs. Additionally, the relatively high prevalence of SpLDs in this undergraduate nursing cohort, compared to undergraduate students overall, highlights the need for innovative approaches in educational delivery and assessment.

The findings presented here provide a valuable starting point for further research into the use and optimisation of different types of assessment guidelines in higher education. Future studies should

investigate the impact on individual students' performances and include larger and more diverse student samples to enhance the generalisability of the findings.

## CRediT authorship contribution statement

**Kieran R. Manchester:** Conceptualization, Formal analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing. **Debbie Roberts:** Writing – original draft, Writing – review & editing.

## Declaration of competing interest

We have no conflicts of interest to disclose.

## Acknowledgements

None.

## Contribution

No other contributions.

## Funding

No external funding.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.nedt.2024.106119>.

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