

*Background paper prepared for the section of  
Health and Education at UNESCO*

A review of the evidence

**SEXUALITY EDUCATION FOR YOUNG PEOPLE  
IN DIGITAL SPACES**

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## Acronyms

GBV	Gender-based violence
ICT	Information and communication technology
ITU	International Telecommunication Union
LGBTI	Lesbian, gay, bisexual, transgender and intersex
LMIC	Low- and middle-income country
NGO	Non-governmental organisation
OECD	Organisation for Economic Co-operation and Development
RCT	Randomised controlled trial
SGBV	Sexual and gender-based violence
SMS	Short message service
SRH	Sexual and reproductive health
SRHR	Sexual and reproductive health and rights
STI	Sexually transmitted infection
UNESCO	United Nations Educational, Scientific and Cultural Organization
VAWG	Violence against women and girls

## Concepts and definitions

**Adolescent:** The United Nations defines adolescents as those people aged between 10 and 19-years of age.

**Bot traffic:** Non-human traffic to websites that results in software applications running automated tasks. Bots also known as chatbots, are computer programs designed to simulate conversation with human users, especially over the internet.

**Comprehensive Sexuality Education:** Comprehensive sexuality education is defined in the revised [UN International Technical Guidance on Sexuality Education](#) as a curriculum-based process of teaching and learning about the cognitive, emotional, physical and social aspects of sexuality. It aims to equip children and young people with knowledge, skills, attitudes and values that will empower them to realise their health, wellbeing and dignity; develop respectful social and sexual relationships; consider how their choices affect their own wellbeing and that of others; and understand and ensure the protection of their rights throughout their lives.

**Digital spaces:** For the purpose of this desk review, 'digital spaces' include websites, chatrooms, social media platforms, shareable video sites, RSS feeds and wikis as well as online and offline messaging platforms ('walkie talkie' apps that use off-grid mesh network technology). Traditional media such as radio, print and television are not included. Digital spaces are constantly evolving and changing.

**Influencer:** A person who has built a reputation for their knowledge and expertise on a specific topic and via their online presence has the power to influence many people, through social media or traditional media.

**mHealth:** An abbreviation for 'mobile health', mHealth is a term for the use of mobile and wireless technologies to support the achievement of health objectives (e.g. to improve health outcomes, health care services, and health research).

**Sexuality:** Sexuality is a core dimension of being human which includes: the understanding of, and relationship to, the human body; emotional attachment and love; sex; gender; gender identity; sexual orientation; sexual intimacy; pleasure and reproduction. Sexuality is complex and includes biological, social, psychological, spiritual, religious, political, legal, historic, ethical and cultural dimensions that evolve over a lifespan.

**Sexual health:** Reflecting the definition outlined in the 2002 [World Health Organization](#) report, *Defining Sexual Health*, sexual health is a state of physical, emotional, mental and social wellbeing in relation to sexuality; it is not merely the absence of disease, dysfunction or infirmity. Sexual health requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences that are free of coercion, discrimination and violence. For sexual health to be attained and maintained, the sexual rights of all persons must be respected, protected and fulfilled.

**Sexual and Reproductive Health and Rights (SRHR):** Sexual and reproductive health and rights or SRHR is the concept of human rights applied to sexuality and reproduction. They include the basic right of all couples and individuals to decide freely and responsibly the number, spacing and timing of their children; and to have the information, education and the means to do so,

and the right to the highest attainable standard of sexual and reproductive health.

**Users:** People who use a product, machine, or service. For example, App 'users' are the new and returning people who visit a App during a set period of time.

**Vlog:** A type of blog using video and designed to share experiences, thoughts, and ideas with an audience, usually hosted on the web.

**Vlogger:** A person who keeps a video blog or vlog, posting short videos of or about something to a personal website or social media account.

**Youth:** The United Nations defines 'youth' as persons aged between 15 and 24. However, the experience of being young can vary substantially across the world, between countries and regions, therefore 'youth' may be defined differently across different contexts.

## Executive summary

This desk review examines the available evidence on the extent to which digital content can influence knowledge, attitudes and practices of adolescents and young people (aged 10–24 years), and looks at the potential for digital spaces to be used to add value to the delivery of comprehensive sexuality education (CSE). Technologies are constantly changing, so this report should be seen as a snapshot of the evidence at a specific point in time.

The report is in two parts. Part 1 explores which young people engage with digital spaces and how; social media influencers; the intersections between pornography and sexuality education; and lessons from mHealth and Information and Communication Technology (ICT) in education. To do this, it draws on purposive searches of the literature, the knowledge and expertise of the interdisciplinary team of researchers, and recommendations from a range of experts.

Part 2 draws on a robust review of the literature on interventions designed to educate young people about sexuality. It focuses on existing evidence in five key areas: (1) reaching and engaging young people; (2) influence and impact; (3) opportunities and risks; (4) content, guidelines and standards; and (5) literature gaps.

The report concludes with recommendations for greater ongoing engagement in this evolving space.

Key findings are outlined below.

### Reaching and engaging young people

- Young people all over the world are the most active users of digital technologies. Over 70% of the world's youth aged 15–24 are online (International Telecommunications Union, 2018). Despite this, the digital divide remains profound between and within regions. In developed countries, 94 per cent of young people aged 15–24 years use the internet compared with 67 per cent in developing countries and only 30 per cent in least developed countries (LDCs) (International Telecommunication Union 2020). A gender gap also persists. Globally, 48% of women compared to 52% of men use the internet, but the gap is much wider in specific regions (International Telecommunication Union 2020).
- Young people's engagement in 'digital spaces' is diverse, changes continuously, and is gender- and context-specific. Digital spaces can be formal or explicitly labelled digital delivery sites and pathways for sexuality education. For example, a number of websites, apps and chatrooms have emerged with the explicit intention of educating young people about sexuality. Young people also engage with information about bodies, sex and relationships through influencers or apps, which may be packaged with a range of other content (including commercial content) and may or may not explicitly aim to educate.
- Digital media can reach excluded groups such as young people in rural areas, lesbian, gay, bisexual, transgender and intersex (LGBTI) people, and people with disabilities. However, digital media may also present obstacles in reaching these groups, due to stigmatising content, technological barriers and risks of exposure.

### Influence and impact

- Digital sexuality education can have impacts on knowledge, attitudes and behaviours. But few interventions monitor impact, and those that do have diverse content, goals, indicators and theories of behaviour change, and are measured at different times, making it hard to compare impacts or reach generalisable conclusions. In addition, the platforms through which digital sexuality education is delivered are changing rapidly and the evidence base cannot develop at the same speed.
- Digital sexuality education can be enjoyable and is widely found to be appealing to young people.
- Creating opportunities for young people to help design initiatives can make them more responsive to young peoples' needs, as well as help the young people develop valuable digital knowledge skills they need and desire
- Online interventions are thought to be more cost-effective and far reaching than offline, but this is difficult to quantify. Some studies try to compare school-based and digital sexuality education impacts. Many find digital education more impactful; however, comparisons are not meaningful if the content and quality vary (e.g. a great teacher is probably more impactful than a not-so-great digital game, and vice versa). Many interventions combine digital education with education in schools or other offline spaces.

## Opportunities and risks

- Digital spaces offer new possibilities – including for marginalised young people – to influence the creation and sharing of knowledge.
- Digital sexuality education may fill a gap for adolescents in places where there is ineffective or insufficient school-based sexuality education provided. It can also complement and strengthen school-based sexuality education. However technological interventions should not be seen as a replacement for interpersonal education.
- Digital spaces can be an environment where bullying and coercion take place, including sexual and gender-based violence. Digital spaces can also provide opportunities to mobilise against this kind of violence. Moderators can seek to create safe spaces in closed or controlled platforms, where young people’s privacy or anonymity is protected. This is cost- and labour-intensive, raises questions about freedom of speech, and about young people’s needs and rights to make up their own mind based on a variety of perspectives.
- Structures of power, including corporate, state, and religious structures, play out online and offline. Understanding and holding to account the institutions of power in online spaces has its own particular challenges, as the regulation, accountability mechanisms, and advocacy around digital spaces struggle to keep up with the rapidly changing technological landscape.

## Content, standards and guidelines

- There is no standardisation of content. Digital sexuality education currently includes a rich diversity of goals, content and audiences, and a range of accurate and inaccurate information. No guidelines have been developed specifically for digital online sexuality education. Is this desirable or practical? The answer is not clear. However, provision of some guidance would undoubtedly be taken up by some content developers. For those seeking to deliver content to a range of age groups, existing guidelines on comprehensive sexuality education (not specifically targeted to digital delivery) may be useful. Guidelines to assist content developers to implement safeguarding measures while still remaining accessible and popular may also be useful.
- While there are a range of examples of platforms that take an explicitly ‘sex positive’ approach to content development and delivery, as with much offline sexuality education, content often focuses more on risk prevention and less on pleasure or wellbeing.

## Literature gaps

- The literature search yielded several interventions targeting young women, only one targeting young men, and none targeting transgender people. No literature was found on interventions targeting people with disabilities. Literature in this field was predominantly by authors located in the global North, and about global North contexts. Targeted searches were done for literature addressing these gaps.
- Digital sexuality education initiatives have attracted huge numbers of young people. However, there is limited research on qualitative experiences of how they engage online, for example who is engaging, their pathways for accessing these sites, why are they looking, why online instead of offline, how do they look, and how do they use the information?
- Impact takes time and can occur in many ways. The two most obvious gaps in research on impact are: research on impact of digital sexuality education (particularly in global South contexts); and research which combines quantitative methodologies exploring how far young people’s knowledge, attitudes or behaviour have changed, with qualitative methodologies asking them how and why.
- A striking gap is how digital sexuality education is affected by and can function within or challenge structures of power in the digital world. The economics of sexuality education, and how the digital landscape is affecting funding patterns and commercialization of services, has received almost no attention.

## Introduction

In response to the rapidly growing connectivity of young people, sexuality education and information are increasingly being delivered through digital spaces, reaching millions. In 2020, COVID-19 has likely intensified this shift, with widespread school closures, education moving online and many young people reporting increased time online. Digital spaces are distinct from offline realities but the lines between them – including sexual and relational lives – are becoming increasingly blurred. Online sexual and relational activities and interactions (such as posting pictures) have intended and unintended offline consequences. While there is an insatiable demand for digital information about sex and relationships, it is unclear if and how digital spaces and digital resources complement offline delivery of comprehensive sexuality education for young people.

To date, most studies have focused on the possible negative effects of young people's online information-seeking and interactions around sexuality, often centred around ideas about the perceived harmful effects of sexually explicit visual content. By contrast, much less is known about the potential benefits. What we do know is that content is diverse, and interventions and access vary according to the age, gender, sexual orientation and location of the user.

There is a growing body of research on sexuality education in digital spaces but the digital landscape changes fast and there are many evidence gaps that hinder informed decision making by practitioners. What do we mean by digital resources on sex and relationships? For example, do they include online interactions between young people themselves? What do we mean by 'young people online'? There is a difference between users who leave after 10 seconds of scrolling and those who (repeatedly) engage and interact – for example, through chat platforms? How can we compare the reach and costs of online versus offline sexuality education and information? Online sexuality education platforms track the number of visitors, while offline private information-sharing with friends about sexuality are not measured. In many countries, sexuality education is provided at schools to all students, which means that non-digital sexuality education – however imperfect – also has a huge reach.

This review includes information on how young people learn about sexuality from digital resources that are explicitly intended to educate (e.g. a sexuality education website or app), as well as those that are not (e.g. social media, influencers, pornography). The report is divided into two parts that draw on two sources of material. Part 1 looks at the broader picture of which young people engage with and learn from digital resources and the role of influencers, intersections between pornography and sexuality education, and learnings from mHealth and ICTs in education. It is based on existing research by the Institute for Development Studies (IDS) on related topics, purposive searches, and material recommended by partners and networks. Part 2 looks at interventions designed to educate young people about sexuality. It builds on a robust search of material on interventions using digital methods that are intended to educate young people about sexuality, supplemented by literature that addresses gaps, recommended by team members from IDS, UNESCO and other partners.

This review cannot escape the predominance of Northern knowledge frameworks. For example, an initial selection of relevant materials searched on the Web of Science database was largely about Northern contexts and by authors in Northern institutions. For this reason, the reviewers specifically sought other literature focusing on Southern contexts.

Part 2 two addresses five key areas:

- **Reaching and engaging young people:** What is known about reach and cost of digital sexuality education interventions? How does the interactivity and flexibility of digital sexuality education engage young people?
- **Influence and impact:** What does the evidence say about the effectiveness of digital modes of delivering sexuality education? Do we know anything about the influence on young people's knowledge, attitudes and practices? Can these be compared to impacts of classroom learning in any meaningful way?
- **Opportunities and risks:** What are the opportunities and risks young people face in sexuality education in digital spaces and what is best practice in tackling those risks? What opportunities exist for digital tools and spaces to enhance or complement the delivery of traditional offline sexuality education in the classroom? What do we know about online bullying and digital sexual and gender-based violence (SGBV) and how to address these? How can safe spaces be created and managed? What roles do gatekeepers and censors (old and new) play?
- **Content, guidelines and standards:** What does content consist of? How accurate and appropriate is it? How far is it comprehensive and how far narrowly focussed on a particular issue or set of issues? Are positive approaches to sexuality included as well as information on risk and harm? How is content gendered? What standards are used to examine digital content and delivery? How can young people know what content to trust?
- **Literature gaps:** What is missing? What areas are under-explored?

## Methodology

Part 1 of the report is based on existing research and related literature as a result of purposive searches and outreach in relevant networks. Part 2 is based on a robust literature review. One of the largest academic databases, Web of Science,<sup>1</sup> was searched using a combination of terms: ‘sex’, ‘sexual’, ‘sexuality’, ‘education’, ‘digital’, ‘online’, ‘internet’, ‘ICT’, ‘youth’, ‘young’, ‘adolescen(t)’, ‘adolescen(ts)’ or ‘adolescen(ce)’, for material published between 2009 and 2019. The initial search yielded 367 resources. The cut-off date was 1 November 2019. All abstracts were read to exclude materials that did not include interventions. Those which were not in English were removed. This brought the total down to 51.

‘Education’ is a broad term, whose meaning overlaps with information, and there are different understandings of what counts as sexuality education. This report does not seek to establish a definition of ‘sexuality education’ against which to measure relevance of studies for this review. Instead, the report reviews literature where authors label their work as sexuality education. Literature has been included where authors use the terms ‘sex’, ‘sexual’, ‘sexuality’ and ‘education’ within the same phrase; so (for example) ‘sexuality education’ and ‘sexual and reproductive health education’ are both included.

The 51 publications include syntheses of multiple interventions and material on specific, individual interventions. They include investigations into impact and influence, content analysis, and overviews of literature on these. They include systematic evaluations, initial tests of feasibility and effectiveness, analysis of content of a particular intervention or set of interventions, action research, and reflections on practice. The evidence discussed interventions on: sexuality education; sexual health; contraception and unintended pregnancy; risky sexual behaviours; HIV; sexual violence; and sexual orientation and gender identity. All interventions targeted young people, broadly but not exclusively aged 10–24 years. Some addressed specific population groups such as girls, young men or ethnic minorities. Of these, 32 focused on the global North, 18 focused on the South, and one on both. Twelve were by authors affiliated with institutions in the South, and the remainder by authors affiliated to institutions in the North. All the overviews were read, and all the literature on specific interventions focusing on Southern contexts. The abstracts of the literature focusing on specific interventions in Northern contexts were read, as were the full articles where they added new insights to already identified themes.

Gaps and imbalances were identified. None of the literature addressed people with disabilities or transgender youth specifically; and research focused primarily on the global North, particularly the USA. Efforts were made to address these gaps and imbalances with targeted searches and by contacting relevant organisations for recommendations of publications or grey literature.

Findings were analysed against the five research areas: (1) reaching and engaging young people; (2) impact and influence; (3) opportunities and risks; (4) content, standards and guidelines; and (5) literature gaps.

Specific efforts were made to include evidence from lower- and middle-income settings and from the global South, by requesting diverse forms of evidence from the team’s networks, including contributors to the *IDS Bulletin on Sex Education in the Digital Era*, organisations working on women’s digital rights, and sexuality educators working through digital platforms in China, India, Brazil, Kenya, Argentina and Bangladesh. The English-language review was supplemented with a consultation of literature recommended by partners in Chinese, and abstracts of selected literature in French and Spanish.

Gendered inequalities persist in both access to and effective use of technology, and the risk of GBV and gender-stereotyping in digital spaces. Digital spaces also offer potential to provide platforms for mobilisation against these, and to empower and educate young people of all genders. As such, the literature has been reviewed with a critical gendered lens, and findings on gender have been included in the review, as well as reflections on what these mean for young people’s access to and use of digital spaces to access sexuality education and information.

## Limitations

Digital spaces change quickly; research on Facebook may, for example, already be outdated because evidence suggests that young people are shifting to other platforms. Academic research and evaluations tend to be costly and require a programme scale that is usually outside the capacities and budgets of most sexuality education programmes. While only one academic database has been searched due to time constraints, it has been

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<sup>1</sup> Both SCOPUS and Web of Science were considered, the two largest academic databases for English language material. Initial searches using a range of search words generated more materials in SCOPUS but a higher concentration of relevant materials in Web of Science. Due to the tighter search results in Web of Science, it was decided to focus on this database. Due to time constraints only the one database was searched.

supplemented with a diverse range of materials. Grey literature and multiple forms of evidence are included in an effort to make this review as current and comprehensive as possible.

There are relevant differences between sexuality education and sexuality information, but it is impossible to know based on keywords whether an intervention or activity is education or information according to international or the teams' standards. Articles may use the term 'sexuality education' but actually talk about providing sexuality information; they may use both terms or not provide sufficient details to know whether they mean one or the other. Therefore, both of these terms are used.

There is a geographical and economic bias: most literature is not from or about lower- and middle-income countries. Data on usage of digital tools and platforms is often not disaggregated by age or gender and is less available for countries in the global South.

## Part 1: The broader context

### 1.1 Connectivity and interconnectivity

Well over half of the world's population now use the internet, and a quarter of a billion new users came online for the first time during the past 12 months. Around 3.2 billion people now use social media each month – almost all of them accessing their chosen platforms via mobile devices (We Are Social and Hootsuite 2019). Of all internet users, young people aged 15–24 are the most connected age group (UNICEF 2017). In developed countries, 94 per cent of young people aged 15–24 years use the internet compared with 67 per cent in developing countries and only 30 per cent in least developed countries (LDCs) (International Telecommunication Union 2020).

Research from the Organisation for Economic Co-operation and Development (OECD) shows that differences in internet uptake are linked primarily to age and education, often intertwined with income levels. In most countries, internet uptake by young people is almost universal, but there are wide differences for older generations. On average, across the OECD, over 97 per cent of 16–24-year-olds used the internet in 2018 compared to about 67 per cent of 55–74-year-olds. Internet usage among 16–24-year-olds is nearing 100 per cent in most OECD countries, except Mexico and Turkey (90 per cent), and Israel and the USA (85–87 per cent) (OECD Publishing 2019). Uptake also varies due to lack of accessibility for people with disabilities and unequal digital literacy.

As internet connectivity on mobile phones grows, so do parental concerns about the content their children are exposed to. A 2019 survey conducted in 11 emerging and developing countries across four regions showed that 79 per cent of adults in these countries say people should be very concerned about children being exposed to harmful content when using mobile phones. A median of 63 per cent say mobile phones have had a bad influence on children in their country (Silver et al. 2019).

A consequence of growing interconnectivity is the extension of physical bodies into digital space through sharing images, voices and avatars (Joshi 2013). Young people experience the online and offline social worlds as 'mutually constituted' (Pascoe 2011) with face-to-face conversations moving online and vice versa. Voluntary sharing of private, sexual materials (photographs, videos or texts) is increasingly common as part of communication within young people's relationships worldwide (Rice et al. 2012; Temple et al. 2012; Oosterhoff, Gilder and Mueller 2016).

Digital spaces are managed and created by organisations that are based within and across national borders. They have to comply with national policies but the digital spaces are transnational and bounded through cultural and linguistic barriers. Transnational dynamics and diasporas are shaping sexual cultures and imaginations.

#### Which young people are accessing digital spaces?

There are persistent gender gaps in access to and use of technology. Over 1.2 billion women in low- and middle-income countries (LMICs) do not use mobile internet, and overall, women are (on average) 26 per cent less likely to use mobile internet than men. There is also a strong negative correlation between women's education and income levels and mobile ownership (GSMA 2018). In developing countries, boys are 150 per cent more likely to own regular mobile phones, and 180 per cent more likely to own smartphones, than girls. Some girls avoid going online for fear of being exposed to inappropriate or harmful content (Girl Effect 2018).

In some contexts, gendered social norms make it less socially acceptable for girls to use digital technology than boys. A global study of girls' mobile phone use showed that even owning a phone in some contexts can pose a threat to their safety. The Girl Effect Study (2018) found that for girls in low-income communities in some countries, ownership of a high-end handset might lead people to assume they had got the phone through transactional sex. Expecting women and girls to use digital technologies in contexts where their use of the internet is actively discouraged, or to use them to advocate for their rights in those contexts, can even put them in danger (van der Spuy and Aavriti 2018). However, in some digital spaces, women may be more active than men. More women than men tend to use Facebook, and are also more active, with more than twice as many posts on their walls and 8 per cent more friends than men (Müller, Oosterhoff and Chakkalackal 2017).

Sexuality information online, including some sexuality education, can stereotype both boys and girls, and exclude any other gender identities. At the same time, anonymised interactions online can provide opportunities for young people to experiment with different gender identities, and to communicate more assertively than they might dare to do face-to-face.

Geographically dispersed groups, LGBTI people or other marginalised groups such as homeless youth and young people in institutional care can sometimes find online information, social networks and support more easily than offline (UNICEF 2019; Livingstone and Mason 2015; Lucero 2017; Hammond, Cooper and Jordan 2018). The benefits of online spaces for people with same sex sexualities to discuss and share have also been found in environments where same-sex relations are criminalised, such as Uganda (Valois 2015). Manduley et al. (2018) find that LGBTI

youth in the USA are five times as likely to search for health information online as non-LGBTI users, and these numbers are even higher for young LGBTI people of colour, which makes the internet a critical source of sexuality education for minority groups. The anonymity it affords also offers a vital space for LGBTI youth from homophobic communities to explore their sexual selves (Dhoest and Szulc 2016).

The internet can also function as a popular channel for sexuality education for young people with disabilities. This has been highlighted in China, for example, particularly in rural areas where school- and family-based sexuality education are even more limited (UNESCO and Humanity & Inclusion 2019). However, Goyal (2016) is critical of digital technologies as perpetuating the power imbalances and exclusions of offline spaces: 'What happens when technology – like digital technologies – that is supposed to liberate us from our bodies, are in fact rigged from the start?' She cites Indian dating apps that do not function with the voice-over technology she, as a woman with disability, uses, and where men with disabilities are more able to express desires for a partner than women with disabilities (Goyal 2016: 31).

Much remains unknown about who is accessing digital spaces. Researchers who are not platform owners cannot determine how many users are bots and how many are genuine users. While Instagram has recently clamped down on influencers who use bots to boost followers, people have devised tactics to get round these measures (Cotter 2019). Some platforms are attempting to balance user privacy with the need to tailor programmes and measure impact. For examples, the smartSex sexuality education app in Africa encourages users to register including giving their age and gender, by offering them incentives such as being able to participate in competitions. Users can still use basic features without registering. Even if users do not register, IP addresses can be used to track countries where they live. However, only a minority of users register.

### How are young people engaging with digital spaces?

Young people's engagement in 'digital spaces' is diverse, changes continuously, and is gender- and context-specific. Digital spaces can be formal or explicitly labelled sites and pathways for sexuality education. For example, a number of websites, apps and chatrooms have emerged with the explicit intention of educating young people about sexuality. Social media platforms such as Facebook and Instagram can be linked to such sites or provide sexuality education indirectly. Sexuality education platforms for young people can have multiple linked components such as articles, activities, bulletin boards or discussion forums. Young people also engage with information about bodies, sex and relationships through influencers or apps, which may be packaged with a range of other content (including commercial content) and may or may not explicitly aim to educate.

Holstrom (2015) analyses how young people are searching digital spaces in the USA, Australia and Europe, based on the available research, which is mostly qualitative with small samples. Three common themes emerge: (1) adolescents use search engines such as Google to find information on sexual health so 'the reach of [the] sexual health website is only as good as the site search engine optimization, which may not necessarily align with the best providers of content on sexual health'; (2) young people are (rightly) concerned about credibility and accuracy of the information; and (3) young people want to stay anonymous when discussing sex-related topics, for fear of stigma and embarrassment, but nevertheless want social interaction through their disguised personas. Holstrom also finds that teenagers are interested in a wide range of topics, not just reducing risk.

Simon and Daneback (2013), drawing on research in more and less developed countries, find that the internet is widely used by young people as a source of information on sexuality. Using combinations of terms including 'sex' and 'education' they reviewed literature covering different themes, including 'What sex-related topics are adolescents interested in learning about online' (2013: 308). Most frequent topics of interest were: transmission of HIV and other sexually transmitted infections (STIs); pregnancy and childbirth; how people get pregnant (for example, can pregnancy occur if a condom breaks during intercourse or if the male withdraws before ejaculation); sex acts and behaviour (for example, how to have anal or oral sex); contraception protection (with specific interest in videos that showed how to use condoms) and what to do if a condom breaks; information about the body such as penis size, genital hair grooming, pain during or after sex; and relationships, including how to communicate with partners about sexual issues, what to do if a partner is cheating on you, and sexual identity and orientation (particularly how to disclose). It was not clear if these themes emerged in the literature because these are the most easily accessed options online or because these are the topics which young people are interested in anyway. It is clear that adolescents are interested in pleasure and sex, sex positions and behaviours. Different age groups tend to look for different content, with younger adolescents more likely to seek out information about puberty and older adolescents more likely to seek information on contraception, STIs and pregnancy (Simon *et al* 2013).

How do young people come to find and engage with sexuality education sites? Little is known about the pathways. This question is addressed in an analysis of online traffic data from Love Matters, an initiative of Radio Netherlands Worldwide Media, targeting 18–30-year-olds in China, Egypt, Kenya, Mexico and India (Müller *et al* 2017). They find that organic searches by people using search engines account for the majority of traffic in Egypt. Traffic from organic

searches is high in local languages such as Hindi and Arabic, where little other pleasure positive sexuality education is available in these languages. In Kenya, the majority of traffic comes from links to social networks such as Twitter or Facebook. How long people stay on the sites and how many pages they look at is also explored and related to how they arrive on the site.

Other data is available on online behaviour, but not motivations or shedding light on behaviours why people behave in these ways.

### Social media influencers

An increasing body of research explores the role of social media influencers in shaping the attitudes of their audiences and ‘followers’ through memes, photos, vlogs, tweets, etc. Though influencers are diverse and their ratings and followers fluctuate, they all offer combinations of education and information with entertainment. Their advice on various topics tends to be well-received because as personalities they are often perceived as reliable, intelligent, relatable and competent (Freberg *et al.* 2011). Influencers may have millions of followers and be well-known to young people while their parents, teachers or other adults have no idea who they are, which poses questions about how to measure and understand “influencing” in the digital era.

Some of the most highly subscribed sexuality education and information vloggers globally are female, such as American YouTuber Laci Green with 1.5 million subscribers and 158 million views, and Natalia Trybus’s Polish channel PinkCandy, with 99,000 subscribers (UNICEF 2019). Others such as the American Actor and YouTuber Kian Lawley (over 3.5 million views) post explicitly sexual content on kissing, and non-penetrative sex acts. Many address topics that may be perceived as ‘controversial’ such as female pleasure and masturbation.

Bodyposipanda, an Instagram and YouTube influencer, built a whole career on self-love and body positivity embracing themes such as plus sizes. Dissemination of images that defy white and skinny body stereotypes can be theorised as an attempt to celebrate diversity (Patterson-Faye 2016; Afful and Ricciardelli 2015). The internet provides a space to discuss sexuality, gender, clothing and religious preferences for American hijabi bloggers (Robinson 2015). A number of LGBTI influencers have large followings and use their channels to share their coming out stories – for example, American Youtuber Connor Franta’s (over 5 million subscribers) gay coming out film has 12 million views, while Australian South African singer songwriter Troye Sivan (over 7 million subscribers) also came out on YouTube. Influencers with large followings are likely to have carefully managed public relations strategies. Nevertheless, the readers or viewers of these texts and images still have their own interpretation, which may be very different from the intent of the producers and is not controlled by those who make them.

Influencers have also addressed topics of sexual harassment and abuse. Influencers and celebrities played an important role in expanding the ‘me too’ movement. Blog writing has been used to facilitate healing and recovery for survivors of sexual assault who did not receive the supportive reaction to a face-to-face disclosure that they desired, by offering a safe environment (Fawcett and Shrestha 2016). But studies have also found that these digital spaces – even when they are set up as safe spaces – can be both supportive and hostile to people who share personal stories, depending on who is in the space and when (van Heijningen and van Clief 2017).

Some vloggers and bloggers are also pornographic performers, such as Japan’s Sola Aoi, who attracted 224,144 followers in the first 24 hours of her microblog (China Daily 2012) mostly due to her popularity in China. Feminist pornography stars such as Stoya from the USA offer critical perspectives on the pornography industry online and offline, authoring books (Reith 2018) and opinion pieces, and have many followers on social media platforms such as Instagram.

Influencers must negotiate the larger political environment. Some sexuality education influencers endeavour to avoid politicizing their features. Others engage directly. At the time of writing, Bodyposipanda features the link to register to vote for the UK elections. Peng Xiaohui, who boasts 33 million regular users (i.e. users who open the microblog at least three times a month) of his ‘Xiaohui talks sex’ microblog has used his platforms to criticize overreliance on western knowledge frameworks among Chinese sexuality educators, as well as to criticize the protests in Hong Kong.

While influencers arguably contribute to shaping of social norms, it would be difficult to measure what their individual influence is, given (for example) that young people often follow several influencers, and the fact that influencers work across several different platforms.

## 1.2 Intersections between pornography and learning about sex

There are some intersections between pornography and learning about sex. Some research suggests young people use pornography to learn about sex (Kroes 2019). Some studies on young adults suggest that sexually explicit material is used as a source of information about sexual positions (Kubicek, Beyer, Weiss, Iverson and Kipke, 2010; Lofgren-Martenson and Mansson, 2010). It is very difficult to know how young people reach sexuality education

sites and if or how pornography can be an entry point (Müller *et al.* 2017). Are some searches for pornography leading to sexuality information sites or vice versa?

Educational initiatives are not always distinguished from pornography by moderators (Oosterhoff *et al.* 2016). There is the famous case of the effort by Argentinian breast cancer charity MACMA to educate women about how to examine their own breasts for likelihood of breast cancer. Because showing women's nipples was widely censored, a male model was used instead (AFP 2016). Digital spaces and platforms such as Facebook are moderated by tens of thousands of subcontracted content moderators. Lack of awareness or lack of time can be among the reasons for the rejection of sexuality education content as pornography. Oosterhoff *et al.* suggest that to investigate these questions, more collaboration with online gatekeepers such as Facebook and Google is needed, as well as developing digital literacy skills for academics and practitioners (2016).

Pornography and explicit material has been used to teach about sexuality. 'sexschool' ([www.refinery29.com/en-us/sex-school](http://www.refinery29.com/en-us/sex-school)), combines inclusive sexuality education with entertainment. They bust myths on what is real and fake in pornography, and discuss sexual techniques and practices in an entertaining, matter-of-fact way. OMGYES.com, a platform endorsed by Harry Potter star Emma Watson (Colgrass 2016), shows explicit videos on how women can reach orgasm, aiming to help women and their partners have better sex, but asserts that the intent is educational rather than pornographic. Originating in Berlin, the sexschoolhub (<https://sexschoolhub.com/>) aims to use pornography for sexuality education, offering educational and explicit videos where sex workers explain or exhibit techniques, consent, safer sex, as well as what can be learnt from pornography, and how to set healthy limits between pornography fantasies and reality.

Pornhub, the world's largest platform for pornography, has launched the Pornhub Sexual Wellness Centre, ([www.pornhub.com/sex](http://www.pornhub.com/sex)) with content about basic sexual anatomy, different STIs and general reproductive health, as well as information to counter unrealistic expectations of sex. The Wellness Centre is very text based, without sexy pictures. Unlike the initiatives previously described which seek to use explicit and appealing material to educate, Pornhub maintains a clear dichotomy between the educational and the entertaining.

### 1.3 Insights from ICT in Education and mHealth

Information and communication technologies (ICTs) can be used to strengthen education systems, knowledge dissemination, and information access, and can impact on the quality and effectiveness of learning. New technologies have allowed children to access a wide range of educational content that was unavailable to previous generations and can enable students to learn at their own pace and develop important digital skills. However, The World Bank Report on Digital Dividends warns that challenges in delivering education effectively cannot be overcome simply through bringing in technology. There are significant challenges relating to cost, implementation difficulties and additional burdens on teachers. Rather than reducing the need for human input in education, the role of teachers becomes more central as a result of the introduction of new technologies (World Bank 2016).

In order to be truly effective in improving educational outcomes, ICTs need to be complemented by appropriate pedagogy, institutional readiness, teacher competencies and long-term financing in the local context (Sharmin *et al.* 2017). Insights from developing country contexts show the importance of focusing on educational outcomes, and then identifying the technologies best suited to help deliver these outcomes; with the implication that 'older' technologies such as radio should not be ignored (Unwin, Weber, Brugha and Hollow 2017).

Digital divides persist both in access to and use of technologies and this has important implications for the use of ICTs in education. UNICEF warns that to be unconnected in a digital world is to be deprived of new opportunities to learn, communicate and develop skills needed for the twenty-first century workplace (UNICEF, 2017). Unless these gaps in access and skills are identified and closed, rather than being an equaliser of opportunity, connectivity may in fact deepen inequity, reinforcing intergenerational cycles of deprivation.

Research for Save the Children on ICTs in developing countries shows the importance of beginning with a holistic view of education, and only then identifying the most appropriate technologies to support their delivery. The authors recommend a greater focus in programmes on using ICTs to enhance and support teacher training, rather than just provision of technologies in schools (Unwin *et al.* 2017).

The rapid increase in access to and use of digital technologies has led to an explosion of interest in the potential of mobile health or 'mHealth' to open up opportunities for learning and health information, but there is much less documentation of SRH mHealth interventions for young people in lower and middle income countries than in higher income countries. Also, although evidence from mHealth is useful to understand the wider digital context, care should be taken to use it for the development of other digital interventions, given the dynamic characters of youth cultures online and offline.

Increasing smartphone access has allowed for development and use of smartphone applications (apps). Mobile

health interventions have previously relied on voice or text-based short message services (SMS); however, the increasing availability and ease of use of apps has led to significant growth of smartphone apps that can be used for health behaviour change. A systematic review of SMS interventions shows that in general, mobile phones and SMS (either personalised or as a bulk message) can be an appropriate way to communicate with people about health issues (Déglise, Suggs and Odermatt 2012). However, a recent systematic literature review on the use of mobile phones for improving community health in Africa found that enthusiasm for mobile technology is not backed by conclusive evidence of impact. In fact, despite the availability of a growing body of research on mHealth in Africa, insights into the complexities of cost-benefit, scalability, transposability, continuity and technology adoption remain limited (Krah and Kruijff 2016).

A systematic review of research from peer-reviewed journal articles using the WHO mobile health (mHealth) evidence reporting and assessment (mERA) checklist found support for a range of uses of mobile phones to improve adolescent SRH. These include SMS-based health promotion campaigns that led to improved SRH knowledge, less unprotected sex, and more STI testing. Importantly, these programmes reached young people across races and genders. However, the authors of the review advise caution about young people in lower and middle income countries because few of the included studies were conducted in these settings (L'Engle *et al.* 2016).

A global landscape analysis (Ippoliti and L'Engle 2017), which looked at mHealth interventions to improve adolescent SRH in lower and middle income countries, found that mobile phones were used to encourage youth to seek health services and to transmit SRH information to them to increase their knowledge and promote positive health behaviours. This review showed that these approaches were particularly valuable for young people living in traditionally conservative societies where sexuality and reproductive health remain highly stigmatised subjects.

However, while mHealth approaches offer a cost-effective and direct way to deliver valuable SRH information, it is vital to consider everyday mobile phone practices, which in some contexts see phones shared or owned for limited times, meaning that delivering sensitive information via this route may be inappropriate. Technology access is not 'binary'; as the Girl Effect study on mobile phone use (2018: 18) shows, '...access is much more diverse and colourful than simply whether they "have" or "have not" got a phone. Access is often transient, and diverse ownership, borrowship and sharing practices are flourishing.'

Sometimes young women's access to mobile technology is mediated by (often male) gatekeepers, making it challenging for them to access SRH information. This was the finding of a study in Nigeria by Akinfaderin-Agarau *et al.* (2012), which explored the barriers and limitations experienced by young women in using their phones to access SRH services. The authors reflect that girls might be reluctant to access such services for fear of being perceived as being sexually active. They recommend that the anonymity of young people using these services should be prioritised over collecting demographic information, which might serve as a deterrent to service uptake. However, they also warn that there is a significant challenge in overcoming the socio-cultural barriers that prevent young women gaining unsupervised access to technology.

## Part 2: Literature review of digital sexuality education for young people

This section focuses on digital interventions designed to educate young people about sexuality. The literature on interventions includes both syntheses of multiple interventions and material on specific interventions. This section outlines the findings of the literature in five key areas: (1) young people's engagement; (2) influence and impact; (3) opportunities and risks; (4) content, guidelines and standards; and (5) literature gaps.<sup>2</sup>

### 2.1 Reaching and engaging young people

#### Reach and cost

Simon and Daneback (2013: 306) cite 'the internet's ease of use, it's availability to increasingly large number of adolescents', while Waldman and Amazon-Brown (2016) assert that sexuality education platforms attract millions of users – significantly more than traditional face-to-face sex educators (Waldman and Amazon-Brown 2016). However, the numbers reached by non-digital sexuality information and education – whether through schools or other kinds of information-sharing, and whether people's learning is intentional (e.g. a peer education intervention) or unintentional (e.g. young people chatting about sex) – have not been quantified but are likely to be extensive. So, it is difficult to compare whether digital sexuality education and information-sharing reaches more young people than non-digital means.

Similarly, claims have been made that digital sexuality education is more cost effective than the alternatives. 'The evidence reviewed has shown us that... electronic education can be quickly and easily replicated and stay cost-effective' (Dunne, McIntosh and Mallory 2014: 407). However, costs in part depend on existing infrastructure. Where large numbers of young people, including girls and lower income groups, have unsupervised access to smart phones and connectivity, then a mobile app might indeed be a cost-effective option to reach them. If they do not, but live in a place where the school system is functioning well, then sexuality education through schools may be a cheaper and more inclusive way to reach young people.

Costs also vary widely between different digital modalities. For example, a static, rarely updated website is likely to be cheaper than an interactive discussion forum where moderators manage safe spaces and ensure discussion that does not violate national guidelines on explicit or political content. And the popularity of platforms may rise and fall, which means that sexuality educators have to be ready to shift their services from one platform to another to maintain audiences, which also incurs costs. Every1Mobile developed an interactive sex and relationship service called smartSex on the South African messaging platform *Mxit*, which attracted 700,000 users in the first three months (Waldman and Amazon-Brown 2017). However, the messaging platform *Mxit* started to decline in popularity, so Every1Mobile re-launched the programme on Africa's most popular mobile browser, Opera Mini. At the time of writing of the article, smartSex on Opera Mini was receiving 155,000 monthly visitors, while *Mxit* users had dwindled to less than 2,000 (Waldman *et al.* 2017).

How far do digital sexuality education interventions reach people of different genders? It is difficult to know users' gender (and age), because even if they are required to log in and give these details, there is no guarantee they give accurate answers. If traffic is largely coming from Facebook, then there is a high chance of more women visitors, as more women than men tend to use Facebook and also tend to use it more actively, posting more frequently and having more friends (Müller *et al.* 2017). Argentina's #ByeTaboo users self-report as 46 per cent women and 54 per cent men. However, almost 75 per cent of users of the online health question and answer service were women (Herbst 2017). smartSex found about 75 per cent of users logging in stated they were male, and 25 per cent female. On Love Matters India's website discussion board, it is mainly men who are asking questions. However, the research does not show whether these differences are due to preference, access to technologies or other factors (Muller *et al.* 2017). Exploring these questions would help tackle issues around gendered access. No research was found specifically on how young people of diverse gender identities use sexuality education platforms (although some research exists on sexual orientation). Many sites do not offer any option for users to identify their gender as anything other than male or female, so the data is not collected, further invisibilising this population.

To what extent does digital sexuality education reach marginalised groups? There is evidence that it presents both advantages and obstacles. One obstacle is that people who cannot afford mobile phones and connectivity are likely to find digital sexuality education less accessible. None of the research looked at income levels of audiences, and this is not a question asked of users. However, several pieces of research find that digital education can reach populations missed by other forms of education (Dunne *et al.* 2014). Manduley *et al.* (2018) find that, in the USA and

<sup>2</sup> Young people's engagement, and how young people learn about sexuality from digital resources, is addressed in Part 1. It was not included as a specific topic to search for in the literature review, as the scope of that search would have been too vast for this piece of research.

Canada, young people of colour and LGBTI people do not receive information that is relevant to them in school-based sexuality education, or their needs and issues included only in tokenistic ways, so online strategies are particularly important in reaching them. Informal networks by marginalised groups have long shared sources of information that challenge mainstream thinking, and now they can reach new audiences at new levels by going online: ‘in digital spaces individuals can connect and share knowledge directly rather than relying solely on top-down information streams’ (Manduley *et al.* 2018). Holstrom (2015) concurs: ‘Young people who may feel marginalised in their home towns can find a safe space online for information sharing’.

Online sexuality education provision, like offline, often excludes people with disabilities either because of content or accessibility limitations. Some online sexuality education providers such as [BishUK](#) endeavour to include people with disabilities, though many do not. In India in 2012, disability and sexual rights advocates launched a website, [Sexuality and Disability](#), to address these exclusions, offering information, advice, personal narratives and more (Tarshi 2018). In the UK, Enhance the UK (a charity run by people with disabilities) has created [The Love Lounge](#) – an online space offering free advice ‘on all things sex, love and disability’.

Digital spaces have also been used for advocacy on disability and sexuality. For example, in China, One Plus One (an NGO run by people with disabilities) produced videos on disability and sexuality, physical poetry, and life stories of people with disabilities, which they shared on Weibo (microblog) and WeChat as well as mass media. (Humanity International 2018). The Indian feminist human rights NGO, CREA, runs an online course, Disability, Sexuality, and Rights Online Institute, which aims to develop awareness of issues of disability and sexuality and a political perspective on disabled people’s sexual rights (CREA 2017).

### Flexibility and interactivity

The research suggests that there are specific characteristics of digital media that make it appealing as a space for learning on sexuality, and more likely to reach different audiences. Digital resources offer ‘... portability, anonymity, informality, “personalized” responses, and the ability to interact with peers who are not local and not part of face-to-face networks (Waldman and Amazon-Brown 2017: 25). ‘This is a sex education that can be private and/or socially networked, text-based and/or visual, available on the go, and personally catered to the information an adolescent seeks in a specific moment.’ (Simon and Daneback 2013: 315). Digital sexuality education offers information on sexual and reproductive health to young adults at a time and place of their convenience (Gray *et al.* 2005; Bay-Cheng 2001).

Digital gaming can provide ‘immersion in the game state and the experience of “flow,” where intense concentration from players minimizes distractions, disbelief, and sense of time’ (DeSmet *et al.* 2015: 79), which can be ideal for learning. However, the features of existing sexual health promotion games may not exploit this potential:

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*Most games did not use many immersive game features. Instead, there was a strong reliance on pure gamification features such as reward and feedback... Future development of serious games to promote sexual health may benefit from using role-play and simulation game formats, individual tailoring to user needs, adaptation of difficulty level of the challenge, and adapting the amount and timing of feedback (ibid.: 88).*

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Gilliam *et al.* (2012: 192) ask: ‘can skills learned in the safe context of gameplay and game design be translated to schools and real-world settings? Can the power of story, a medium that is safe familiar and engaging for youth, leverage positive outcomes for those who live in contexts that are often harsh and sometimes dangerous?’ This raises the larger question about the relationship between attitudes and behaviour expressed in the virtual and material worlds – a question that has been explored extensively in relation to pornography viewing, and still defies conclusive answers.

How feelings expressed in the virtual and material worlds relate to each other is exemplified through the qualitative research findings on the alternate reality game *The Source*. Source tells the story of Aida, who tries to track down her missing father, eventually finding a letter from him saying he had left on discovering her brother was gay. Focus group discussion with young players – mainly from disadvantaged communities in Chicago, USA – found that many players also had absent or disengaged fathers, and identified with this aspect of the scenario. Some liked trying to solve the mystery of why the father had left, but for others this seemed too close to their reality, which made them uncomfortable. One boy wondered why he was putting so much energy into looking for Aida’s father instead of his own. The research finds ‘that alternate reality games need to balance realism and fiction, as this may affect how players engage with and potentially learn from the game’ (Bouris *et al.* 2016: 363).

The potential of interactive methodologies to deliver information and education has not been realized, in some cases due to the cost. In general, websites had low mobile compatibility. Many sites offered important information in a relatively static way, relying on text and non-moving graphics (Whiteley *et al.* 2012). Kalke *et al.*'s 2018 systematic review of sexuality education apps finds they are also limited in terms of content and features. While more than two-thirds of the apps conform to health literacy principles in terms of clear organisation and navigability, the language is too complicated, failing to address low literacy audiences who have the biggest sexual health challenges. Few of the apps used pictures, audios, videos or other interactive features that young people were more likely to be enthusiastic about.

## 2.2 Impact and influence

The research suggests that digital sexuality education mechanisms can have impact. The overview studies and literature on specific interventions (largely in the global North) generally found significant positive impacts, at least on knowledge and attitudes (DeSmet *et al.* 2015; Dunne *et al.* 2014; Guse *et al.* 2012; Holstrom 2015; Simon and Daneback 2013; Widman *et al.* 2018). Much of the evidence suggests that young people enjoy using digital mediums (Dunne *et al.* 2014). However, research on influence and impact of digital sexuality education and information on youth is limited, particularly on longer-term behaviour change (DeSmet *et al.* 2015; Dunne *et al.* 2014).

Research uses varying methodologies and measures, and is disproportionately focused on the USA and other Northern contexts.

USA-based studies have shown that 36 per cent of teenagers report changing health behaviour because of an app (Wartella 2015), and three out of four US college students have downloaded health and medical apps to their smartphones (Richman *et al.* 2014). Again, in the USA, 41% of adolescents have changed their behaviour due to health information found online, and almost half have contacted a healthcare provider as a result (Ybarra 2008). These statistics suggest that digital sexuality education can have positive impacts.

Other studies show a range of impacts, including on knowledge of HIV and pregnancy prevention, SRH, more gender-equitable attitudes and changing attitudes towards sex (see below).

### Findings from meta-analyses

Meta-analyses which try to reach generalisable conclusions face various challenges. Three meta-analyses that address impact were identified (Guse *et al.* 2012; Widman *et al.* 2018, DeSmet *et al.* 2015), and one comprehensive literature review (Holstrom 2015). Four studies that were selected to be analysed were used by more than one of these authors.

Widman *et al.*'s (2018) meta-analysis of studies of technology-based sexual health interventions among young people looked at 15 years of research up to May 2017. They reviewed only programmes that measured condom use or abstinence as outcomes. 16 met their criteria. They found that overall, the interventions had significant effects on increasing condom use and abstinence, although effects lessened over time. There were also significant impacts on sexual health knowledge, social norms for safer sex activity, and safer sex attitudes. However, there were no significant impacts on safer sex intentions or perceived self-efficacy to engage in safer sex behaviours. This piece of research is one of the most systematic, large-scale, labour-intensive meta-analyses thus far, and the interventions selected were rigorous, with 14 randomised controlled trials (RCTs). Nevertheless, as already noted, limitations include substantial variation in defining outcome measures, and none of the programmes assessed intervention effects beyond one year. In addition, the results seem slightly contradictory – such as findings of significant impact on safer sex behaviours but not on safer sex intentions.

Guse *et al.* (2012) undertook a large-scale systematic review of research on the use of new digital media to improve adolescent sexual health. Of 10 studies that fit their criteria, some did not measure behavioural impacts, while three showed significant impacts on behaviour (e.g. delaying initiation of different kinds of sex, improving condom norms and condom usage, and young people changing their MySpace profiles – for example, by removing sexual references). However, psychosocial impacts were less clear. One study found that the intervention reduced self-efficacy. Two others showed contradictory results; one found condom-related indicators showing significant impact in contradictory directions. These results show that even in such a systematic meta-analysis, findings are not necessarily clear. Much depends on content of the programmes researched, and how things are measured. It may be of limited value to generalise about the effectiveness of any digital sexuality education intervention without looking at its content and quality.

DeSmet *et al.*'s (2015) meta-analysis of digital games found that these have small but significant effects on knowledge, attitudes, self-efficacy skills and behavioural intention, although they did not show significant effects on behaviour.

Holstrom (2015) carried out a comprehensive literature review of research on online sexuality education conducted between 2005 and 2015. She presents six evaluation studies of internet-based interventions targeted at users aged 13–24 years. Three of these were also used by Widman *et al.* and/or Guse *et al.* Unlike Widman *et al.*, Holstrom refuses to compare efficacies because of inconsistencies in measurable outcomes, different theories of behaviour change, and lack of theoretical foundations in the different studies. She does, however, conclude that interventions yielding modest results are worth replicating and continuing to evaluate. She recommends building consensus on ‘what is a successful outcome, how to measure it, or what theoretical foundations should be used to build interventions’ (Holstrom 2015: 288). She also highlights that there is some overlap and some mismatch between the evaluated interventions and what adolescents want from a sexual health website.

How can the gaps and contradictions in the research be addressed? One possibility would be additional impact evaluations, RCTs, and meta-analyses, particularly by Southern researchers on Southern contexts, which would require substantial investments. However, there is a lack of understanding about the limitations of RCTs, especially when they are not combined with other methods that can explain not just what has happened but why (Deaton and Cartwright 2018). In the shorter term, Holstrom’s suggestion that interventions showing positive results should be replicated and subject to continued evaluation might be more pragmatic, especially if such evaluations combine complementary research methods.

A different approach to finding out if and how digital sexuality education works is to focus on quality and content, within each context, so that local specificities can be taken into account, and can ground any transferable learning. Oosterhoff *et al.* (2017) bring together examples of research from different regions in Africa, Latin America and Asia, highlighting that ‘...the common themes encountered... are often as striking as the differences’ (Oosterhoff *et al.* 2017: 2). Common themes include the importance of digital spaces to young people’s learning, the prevalence of pornography, and the political nature of digital sexuality education requiring ongoing negotiations with institutions of power whether state, corporate or religious. Differences include levels of connectivity, sensitivities around different topics, and different possibilities for funding from state or donors. Digital media platforms developed for one specific audience or geographical location are usually accessible beyond this, with take-up by other audiences, sometimes in neighbouring countries. Waldman and Amazon-Brown (2017) found this to be the case in sub-Saharan Africa, as did Herbst (2017), with #ByeTaboo, developed in Argentina but attracting sizeable audiences from Mexico. Learning and resources may be transferable beyond specific contexts; however, any generalisations need to include examination of content and interactions with audiences to be meaningful. The review of the literature on specific interventions yields some of this complementary information.

### Findings from literature on specific interventions

Several studies of specific interventions find different kinds of influence and impact. Again, goals of the interventions, meanings, and measures for influence and impact vary significantly.

An interactive game playable on Facebook, iPad and the web aims to equip young adolescents in Hong Kong with reliable knowledge and positive attitudes towards sex and relationships (Kwan *et al.* 2014). It offers different scenarios where players follow through their decisions in their chosen virtual characters and learn in the process. A quantitative survey showed that after playing the game, students’ knowledge of sex improved. Respondents felt that the game had helped them enhance their critical thinking, decision making and ability to seek help on love and sexuality issues.

*Lucidity*, an interactive multimedia game on sexual violence, developed for use in the USA, enables participants to make decisions about what happens in the story, leading to two different outcomes (Gilliam *et al.* 2016). At follow-up, it was found that almost all participants had initiated a conversation on sexual violence with a parent, peer or teacher.

Gilliam *et al.* (2012: 191) assert that ‘... we are developing and studying a new youth-driven approach to sexuality education: education through invitation rather than intervention’, a sexuality education that appeals to young people so strongly that they voluntarily engage with it because they want to, not because it is part of a top-down educational program that they are obliged to participate in. Their programme, in Chicago, USA, ran workshops for young people to develop a narrative-driven game discussing issues such as rape, gender inequality, incarceration and parent communication, and subsequently a transmedia game (‘a single story across numerous technologies and media... can include text, video, audio, flash, print, phone calls, websites, email and social media networks’ (*ibid.*: 192)). The young people created a story based on research showing different pregnancy outcomes according to wealth and social status. While this process is very intensive, the aim is also ambitious, going beyond imparting health knowledge or generating safer behaviours to enabling young people to take a systems approach to solving sexual health problems. Evaluations showed changes in attitudes, and increased knowledge, research and technology skills.

Again in the USA, Bouris *et al.* 2016 note gender differences in the impact of the alternate reality game, *The Source*,

which aimed to improve SRH knowledge and change homophobic attitudes, with young women tending to report greater impact on their knowledge, attitudes and behaviours than young men. However, the research did not explain why. Other US-based research has found that girls are more sensitive to the potential negative consequences associated with sexual behaviours (Guilamo-Ramos *et al.* 2007, cited in Bouris *et al.* 2016: 364) and are thus more attentive to sexual health information (Petersen and Hyde 2011 cited in Bouris *et al.* 2016: 364). This may reflect internalised gender stereotypes about girls' responsibility for saying 'no' to and controlling sexual encounters.

Several studies compare impacts of classroom and digital sexuality education interventions. Doubova *et al.*, 2016 and 2017, in Mexico find that the impact of digital interventions is greater than that of classroom interventions. However, one obvious problem with much of the research is the lack of examination of the content and quality of the intervention vs. the control group. If a teacher delivering the intervention is 'boring' or untrained, it may be hard for them to compete with a digital innovation introduced by a research team. One article on an intervention in Tanzania (Haruna *et al.* 2018) found that students preferred the online quiz to the classroom teaching because the teacher often beat them with a stick.

## 2.3 Opportunities and risks

The literature identifies specific characteristics of digital spaces in terms of opportunities and risks for sexuality education.

### Compensating for or complementing school-based education

Many digital interventions are pitched as compensating for perceived weaknesses in school-based sexuality education (Magee *et al.* 2012; McCarthy *et al.* 2012; Chen 2017; Simigiu 2012). Chen (2017) finds that in the USA, in an environment of declining school sexuality education (particularly in rural areas), online sexuality education can help fill this gap: 'online sexuality education is a promising and preferred method of delivery for sexuality education for students and health teachers, particularly in settings where trained health teachers are not available or less willing to deliver state-mandated content' (*ibid.*: 105). In Romania, Simigiu (2012) found that students ask more questions online than in the classroom, because online spaces can offer anonymity and can circumvent conservative attitudes. A study of secondary school girls in Enugu, Nigeria found that part of the appeal of accessing information on reproductive health through the internet is that they do not have to ask adults (Ibegbulam *et al.* 2018).

However, several interventions situate digital sexuality education as complementing school-based education (Strasburger 2014). As UNICEF (2019: 40) states:

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*These interventions need not be considered a replacement for the traditional teacher-led approach, but rather a complement to comprehensive sexuality education, which will reinforce and enrich knowledge and attitudes. These platforms also have the potential to tailor and target interventions at specific at-risk populations, provide 'personalized' responses and the ability to interact with peers who are not local or part of in-person networks. For some young people, such as out-of-school or LGBTI young people who may not be adequately reached with mainstream, curriculum-based approaches, it may be the only information source available. Certainly, digital media can allow children and adolescents to seek out information how and when they want it, with the potential to do so at scale.*

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Aragão *et al.*'s (2018) study looked at researchers and nurses facilitating discussions on Facebook on SRHR, sex, gender and health topics for students from a disadvantaged area of Fortaleza (Ceará state, Brazil) with high teenage pregnancy rates. This study describes both school and cyberspace as 'environments where... adolescents congregated' (*ibid.*: 267), seeing both as valuable spaces for health education for the same reason: 'this study reaffirms that it is possible and necessary to "go where young people are"' (*ibid.*: 270) and sees this as the value of digital sexuality education.

Several interventions combined classroom teaching and digital media. Arnab *et al.* (2013) describe a digital game used in UK schools to help students avoid coercion. They found that 'blending this interactive game-based approach with traditional classroom delivery encouraged the teachers and students to engage in communal discussions and debriefing during and after game play' (*ibid.*: 15).

Black *et al.* (2018) describe qualitative research on how to develop a sexual health education intervention for

American Indian and Alaska Native (AIAN) youth, where a classroom component was felt to be a necessary complement to the digital. ‘However, electronic interventions are also impersonal and this can be culturally incongruous for AIANs and other populations for whom traditional ceremonies, practices and patterns of interpersonal communication are central’ (*ibid.*: 59). In response to community concerns, they developed a hybrid programme, supplementing electronic interventions with classroom lessons that enabled discussion, adaptation and community involvement.

Briñez *et al.* (2019) find ‘the fact that technology is used does not necessarily constitute innovation, nor does it necessarily raise the quality of teaching processes. It is the way technology is used that creates innovation’ (*ibid.*: 410). They carried out action research on an ICT-based intervention in middle schools in Colombia aimed at promoting self-care around SRHR. This was action research led by a science teacher who observed many girls in her classes dropping out of school when they became single parents. In this case, the teacher found the technology helpful because she used it to reorient her role from imparter of information to facilitator of an interactive learning process.

Technical challenges and cost of equipment may hinder implementation of programs using digital technology in schools. *The World Starts With Me*, is a ‘low-tech, computer-based, interactive sex education programme aimed at secondary school students (age 12-19)’ (Rijsdijk *et al.* 2011: 2). In Uganda, most implementing schools did not have enough computers (sometimes one computer was shared by up to 50 students) and electricity was unreliable. The programme could be implemented with students reading the material and doing exercises using hard copy manuals, but this lost some of the interactivity component. The experience of this programme illustrates the challenges of resource constraints in a computer-based sexuality education intervention.

Another school-based programme in Uganda sought to test the acceptability and feasibility of *CyberSenga*, an internet-based HIV prevention programme for adolescents. Unlike *The World Starts With Me*, *CyberSenga* provided laptops and internet routers powered by a car battery and set up by study staff, so the basic technological infrastructure was provided (Ybarra *et al.* 2014). Nevertheless, implementation was constrained by multiple technical challenges. Most young people did not have email, so were unfamiliar with creating and remembering a password. And an error in the software programme, as well as some laptops being incorrectly configured, affected the implementation and research process. These experiences are a reminder of the realities of technical challenges and resource constraints in certain contexts.

### Sexual and gender-based violence and other harms in digital spaces

Digital fora can provide space for gendered, racialised, homophobic and other forms of violence (Todaro *et al.* 2018; Manduley *et al.* 2018; Oosterhoff *et al.* 2017). Women and girls, women who experience violence offline, racial and ethnic minorities and LGBTI, human rights defenders and activists, and people in the public sphere may be particularly vulnerable to cyber bullying. The mental health effects of online bullying and GBV as well as the socioeconomic consequences are being increasingly reported (Hinduja and Patchin 2007; Patchin and Hinduja 2006; McDool *et al.* 2016), and can be an extension of domestic and intimate partner violence.

UNICEF (2019: 41) categorises risks to children in digital spaces as either content risks: ‘exposure to inappropriate content such as sexual, pornographic or violent images, some forms of advertising, discriminatory or hate speech and sites advocating dangerous behaviours, e.g., suicide’; contact risks: ‘inappropriate contact, for example, an adult contacting a child to solicit sex or individuals encouraging unhealthy or dangerous behaviours such as sexual risk-taking’; or conduct risks: ‘scenarios where children contribute to risky content or contact’, where young people might be aggressive or abusive towards other users. UNICEF (2019: 43) concludes that digital literacy can reduce vulnerability and that ‘there is a need to develop a comprehensive digital sexuality education framework that guides initiatives and addresses child protection issues’.

The extent of harm and coercion in digital spaces is hard to quantify, and the subject of much concern.. Livingstone and Smith (2014) find that, based on an international literature review, less than 1 in 5 adolescents report being negatively affected by cyberbullying, contact with strangers, sexual messaging and pornography. Of 9–16-year-olds in the European Union who said they had met an online contact offline, only 1 in 9 found the experience in any way bothersome.

There is limited data on cyber violence and GBV in digital spaces in general, and particularly on what works to prevent it. This is partly due to it being a relatively new phenomenon, coupled with the challenges in researching a complex global phenomenon; it is also exacerbated by the difficulties in making comparisons over time and place due to different types of online violence, definitions and research methodologies.

A recent report for the UK Department for International Development’s (DFID) Violence against Women Helpdesk found that school-based interventions have potential to take primary prevention of cyber VAWG to scale, by reaching large numbers of young people at a time when norms around gender and online violence are being shaped.

Although systematic reviews have observed an increase in knowledge and decreases in risky behaviour, there are limited studies looking at long-term sustainability of changes, and most studies are based in the USA or Canada (Faith and Fraser 2018).

Digital fora can also provide space to respond to and mobilise against GBV and other forms of violence. A Mumbai-based NGO, Breakthrough, undertook the *Bell Bajao* ('Ring the Bell') campaign, which encouraged people to act against domestic violence and sexual harassment, with video campaigns targeting men and young boys. After its launch, men, women, boys and girls shared their stories of intervening to stop GBV (UNESCO 2019). *R.AGE* in Malaysia is piloting a chatbot for Facebook Messenger, which will offer young people guidance on how to reduce risks such as grooming (UNESCO 2019).

GBV, including domestic violence, is widely understood to be a public rather than a private issue (Jewkes *et al.* 2002; Heise and Garcia-Moreno 2002). But it is not clear what public responsibility for GBV means in digital, transnational spaces largely owned by a few commercial corporations such as Facebook and Google. The digital safety policies of these commercial internet platforms that reach billions of people are increasingly criticised for their inability to prevent attacks on women and minorities (Hopkins 2017). This leaves the responsibility to individuals, while simultaneously explicitly censoring feminist and SRH efforts (Ganesh 2016).

### Anonymity and the creation of safe spaces

Creation of 'safe spaces' is an important element of how to tackle the risks of harm in digital spaces. Recommendations on how to create safe spaces include making sure people know how and where information is being shared, who will see it, and what happens if it goes viral, as well as considering how a platform's corporate interests will affect the way content will be disseminated (Manduley *et al.* 2018). Online moderators have an important role to play: 'Creating a safe space requires guidance by trained and supervised moderators who can create a community atmosphere that enables friendships to grow, and to establish some form of digital accountability for users' (Oosterhoff *et al.* 2017: 3).

Anonymity is hugely important to young people's potential for learning about sexuality from the internet, and also a tool to protect against violence. The overviews reviewed that discussed user anonymity all did so positively (Holstrom 2015; Oosterhoff *et al.* 2017; Simon and Daneback 2013; Whiteley *et al.* 2012). As Holstrom (2015: 281) explains, 'anonymity is a major concern for young people. They do not want others to know that they are searching for sexual health information, most often because they fear stigma or embarrassment'. 'Users must remain free to create anonymous online personas in order to protect themselves' (Oosterhoff *et al.* 2017: 4). Simon and Daneback (2013: 306) add, 'The internet is perceived as a more private and anonymous place where young people can view sexually explicit materials, try on new identities, and practice coming out as gay'.

In online ethnography and targeted interviews with selected respondents using the Love Matters Kenya Facebook page, some young people said it is difficult to talk about sexuality, particularly for women, so anonymity is important in enabling an online safe space for self-expression (van Heijningen and van Clief 2017). However, this also means people can post offensive comments without worrying about the consequences, which can make others feel less safe. But what does anonymity actually mean? Respondents in the Facebook group:

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*... had different understandings of what this actually meant... because many were using profiles that revealed their real-world names and pictures. But anonymity is not always understood as being completely unidentifiable; for some group members, the physical distance of being online – whether or not they were using their real name to comment – was a form of anonymity in itself.*

*(ibid.: 13)*

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Writing things down rather than speaking face-to-face felt safer to respondents: 'Complete anonymity... was therefore a relatively unimportant factor in creating an online safe space; rather, it was the physical distance and asynchronous communication that provided a sense of safety' (*ibid.*: 13).

In order to develop a community, build trust and relationships, members need to be somewhat identifiable: 'If communication is purely anonymous there is no build-up of past interactions' (*ibid.*:13). Just as is the case offline, personal relationships and friendships are important sources of peer-to-peer learning on sexuality, and friendships often take place in both online and offline spaces. Creating a feeling of community, friendship and social exchange is

also part of what makes people feel safe.

Yet there is also exchange of pornographic as well as negative content and misinformation. The same study observed that ‘... when a topic was more transgressive, disruptive behaviour on the Facebook wall was more likely’ (van Heijningen and van Clief 2017: 15). For example, topics such as homosexuality or sex before marriage were sometimes responded to by people saying anyone doing this should go to hell.

How should online moderators respond? Often, with Love Matters Kenya, instead of blocking the negative comments, they give greater visibility to supportive comments – for example, responding with ‘LOL’, ‘I agree’, ‘great comment’ or pressing the ‘like’ button. And they respond to audience members who send private Facebook messages asking moderators to post about a particular issue that they do not want to take the initiative of raising themselves. There are also clear codes of conduct which members are asked to respect. For example, people who violate community guidelines on respectful conversation get three warnings before they are permanently blocked. Social media managers for Love Matters have some leeway to decide when to allow or block a comment, and decisions are sometimes difficult (*ibid.*).

Some other platforms do not have the resources to take on this kind of ongoing moderation, so decline to allow these interactive spaces. The smartSex platform moderates all peer interaction before publication, so there is no private chatting or live exchange on the site: ‘smartSex, as a non-funded site, does not have the resources to keep open comment areas “safe” and protect both users’ and the brand’s reputation’ (Waldman and Amazon-Brown 2017: 34).

Part of the risk can be that online spaces feel safe and private, even if they are not. It can be easy for some individuals to observe and learn from the group without other individuals knowing they are there: ‘listening while being silent is a valid strategy for young adults to mitigate the risk of voicing their opinions online’ (Pearce and Vital 2015, cited in van Heijningen and van Clief 2017: 10). However, this also means participant’s messages may be visible to a large and unknown network (Van Heijningen and van Clief (2017: 9). Even with anonymity, users can be trackable. For example, in the UK, rape victims can be requested to hand over mobile phones and other devices to the police for a full digital inspection (End Violence Against Women Coalition 2019).

#### Power structures: who controls digital spaces?

Digital media has the potential to disrupt traditional ways of producing, sharing and understanding sexuality information and education and change the relationship between authoritative knowledge and young people’s informal knowledge (Kroes 2019, Manduley *et al.* 2018). Digital spaces offer young people options outside of the information transmitted and controlled by parents and other traditional gatekeepers. (Manduley *et al.* 2018). At the same time, digital spaces are subject to ‘the immense power of new supranational commercial digital gatekeepers such as Facebook and Google’ (Oosterhoff *et al.* 2017: 1), and their equivalents in countries where they or their affiliates are blocked (e.g. China and Iran).

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*Corporate interests...impact free speech, user privacy, transparency over terms of service, and more. This affects who gets censored, what ads get promoted, what kind of content is highlighted or buried through a website’s algorithms, what kind of user data is gathered and often sold (Manduley 2018:161).*

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Does the increase in options for sexuality education available online represent the commercialisation and commodification of sexuality education? Does it constitute a shift from state and NGO provision of sexuality education to provision by social enterprises, for-profit organisations and not-for-profit sites supported by funders with their own interests? Given the challenges facing delivery of state-provided comprehensive sexuality education in many countries (UNESCO and Guttmacher 2019), and the lack of funding for sexuality education initiatives by NGOs, commercially sponsored or for-profit sexuality education may in some contexts fill a gap in comprehensive provision of sexuality education. An analysis of the economics and funding of digital sexuality education and its effects is much needed to understand if the increasing provision of sexuality education through digital means constitutes a commodification of this arena.

In China, some sexuality education providers have become commercialised, or set up as businesses, with pay-per-view, or making money from associated product promotion. One as yet unpublished study finds they have been found to have positive impacts on young people’s knowledge, concepts and awareness, but also lack consistent quality and exclude disadvantaged groups (Zhao forthcoming).

The structures of power controlling digital information on sexuality may be commercial, religious or governmental..

Some digital sexuality education initiatives are supported by government. A notable example is *#ByeTaboo* (Herbst 2017), which was funded by the Buenos Aires city government in Argentina. *#ByeTaboo* faced organised resistance from the church but was defended by the city government, enabling the programme to survive.

In sub-Saharan Africa:

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*smartSex has grappled with how to deliver SRH information in conjunction with, and in recognition of, the specific cultural context in which users reside. It prioritises internationally recognised medical or psychological facts, placing users' wellbeing above the laws and/or social norms of the countries. smartSex therefore explicitly recognises a range of sexual identities – gay, lesbian and heterosexual – and makes it possible for users to identify with them. Abortion – another highly contested topic – is dealt with similarly. (Waldman et al. 2018: 33)*

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*smartSex* presents abortion as one of many options available in case of unwanted pregnancy, but also advises that local laws differ on this.

Müller et al. (2017) describe how *Love Matters* operates within national legal policy frameworks as well as within the restrictions on internet by national governments. For example, in China, no graphic content or details about sex are published even if material is available elsewhere in Chinese online or offline spaces. Because there are no clear guidelines and the state relies on internet platform providers to censor themselves, it is always a challenge and carries a degree of risk.

In Egypt, one *Love Matters* blogger was arrested for something he had written on another platform. Also in Egypt, a discussion of sex during menstruation generated angry responses, with some readers saying that there was a Koranic verse against it, while others argued that the verses are actually about personal hygiene. *Love Matters* suddenly found itself in the middle of a heated religious debate.

In several countries where *Love Matters* operates, the state is challenged by insurgent forces such as Isis or al-Shabaab. 'SRHR is often a contested area for both the state and... insurgent forces, which drapes layers of insecurity over editorial decisions. Therefore, the challenge in each country is to figure out how to promote editorial content without jeopardising relationships with local NGOs or governmental organisations' (Müller et al. 2017: 73). This situation is similar to offline sexuality education. However, for digital sexuality education, the government needs resources and technological know-how to censor material, and for this to exceed people's ability to get round such measures.

How can these risks be addressed? One approach is to understand who is controlling these spaces and to what purpose. Work by organisations such as the Association for Progressive Communications, Tactical Tech, and the Red en Defensa de los Derechos Digitales, (R3D) provide valuable analysis and advocacy around these questions, and how to move towards a more feminist and accountable digital world.

## 2.4 Content, standards and guidelines

Analysis of the array of sexuality education content currently available online shows a diversity of content while also highlighting that some topics are covered to a much greater extent than others. There is a question as to whether digital sexuality education resources should strive to be comprehensive in the same way as a formal education programme, given that they are likely to be one of several resources that young people use. However, several commentators have argued that overall content in digital sexuality education is narrow and skewed as described below.

Whiteley *et al.*'s 2012 review of sexual health websites for adolescents found 'deficiencies in educational content, as well as deficiencies in usability, authority, and interactivity' (*ibid.*: 209). Kalke *et al.* 2018 noted similar findings in regard to apps. The apps reviewed were not based on what is known about how to change people's behaviour, and did not give users opportunities to role-play or model positive behaviours. They had limited interactive features such as videos, quizzes and games. Holstrom (2015) finds that 'information about STIs was largely reliable on the top thirty-five websites that came up in Google searches of common sexual health questions' but inaccurate in other topic areas (*ibid.*: 282).

Holstrom cites the importance of user input and feedback for improving content, and advocates using existing

guidelines for sexuality education adapted for web-based sexual health interventions. She recommends a more positive perspective on sexuality, using plainer language, demonstrating healthy behaviours more interactively, and more focus on marginalised populations such as LGBTI.

Whiteley *et al.* (2012) found no correlation between interactivity and more comprehensive content in sexual health websites. [Stayteen.org](http://stayteen.org) had role-playing exercises in which teenagers could become a cartoon character and role-play making safe decisions, but this covered only about a quarter of the categories recommended by the Sexuality Information and Education Council of the United States as constituting a comprehensive programme.

### Pleasure and sex-positive approaches to sexuality

Young people want information on sexual pleasure as well as many other topics. Recent research from five countries in the global South provides empirical evidence to support the notion that young people are actively looking for sexual health information that covers the full scope of sexual experience and pleasure, including, but not limited to, the reduction of health risks (van Clief and Anemaat, forthcoming: 1). Holstrom's (2015) review found that young people want information about sexual pleasure, how to communicate with partners about what they want, and specific techniques to pleasure their partners. In focus groups in London to develop the *Sexunzipped* site, young participants aged 16–22 said they wanted information on the pleasurable aspects of sex, presented in a non-judgemental way. They also wanted information on 'sexually transmitted infections, pregnancy, how to communicate with partners, how to develop skills in giving pleasure, and emotions involved in sex and relationships' (McCarthy *et al.* 2012: 4).

There is a huge amount of content online about sexual pleasure, but interventions intending to educate people about sexuality rarely address this topic. Todaro *et al.* (2018: 1158) note, 'Most of the online sexual education interventions are focused on adolescents' risk behaviour prevention instead of sexual well-being promotion'. Simon and Daneback (2013) concur that sexuality education web sources tend to focus on how adolescents can be victims of sexual harm and lack positive messaging about sex, as with much school-based or other face-to-face sexuality education (Ford *et al.* 2019).

Holstrom (2015) found that of 12 websites frequently mentioned as the best for sexual health information targeted at teens, only *Sexunzipped* (which was designed based on focus groups with young people) gave substantial attention to pleasure. Marques *et al.* (2015) analysed content of 14 sexuality education websites targeted at adolescents against the International Planned Parenthood Framework for Comprehensive Sexuality Education. They found that 'A majority of content across all sites focused on sexual and reproductive health and HIV, particularly pregnancy and STI prevention, and other information about STIs and HIV. No other topic comprised more than 10% of content coverage across a majority of sites' (*ibid.*: 1310). The authors found little discussion of gender issues, sexual rights, sexual diversity, or sexual violence. Most sites provided only brief references to sexual pleasure, generally moderated with cautionary words.

While pleasure is often sidelined in sexuality education in digital or non-digital spaces, there are notable exceptions and growing experience in this area. UK's *Sexunzipped* made 'Sexual Pleasure' one of three sections on the site, and included content such as tips on how to relax, things to try if you are not enjoying sex, and masturbation (McCarthy *et al.* 2012). Agents of *Ishq* in India celebrates India's erotic traditions such as in poetry and Hindi film songs, and combines these with contemporary features such as users' stories of their most memorable sexual experiences, whether good, bad or indifferent (Jha 2017). Herbst (2017) describes how, in Argentina, #ByeTaboo's objective is '... providing information not only about sex and sexuality, but also about young people's rights in order to challenge power relations and instil agency for them to determine their needs. Thus, the focus across the site is never "what not to do" but rather "how to safely enjoy what you want to do or are doing"' (*ibid.*: 48). The platform takes a positive framing of sex and sexuality.

Young people (even in conservative environments) often have access to representations of sexual pleasure through peer exchange, popular culture or pornography. For this reason, Justin Hancock, founder of the BishUK site, says he does not aim to be 'sex positive' but rather 'sex critical': 'much of the sex education that young people have today... is very sex negative – presenting sex as something with inherent risks and dangers and something to be avoided'. At the same time 'young people... are often bombarded with the opposite message from sex advice and broader culture which says that sex is inherently valuable and that we have to do it (and that "it" is intercourse). I try to make BISH neither of those things and instead occupy a "sex critical" space. That is to explore the messages that we all receive about sex and to critique them (and ask the reader to do the same). This is to help us all tune into what we might actually want from sex and relationships rather than have the sex and relationships we feel we should have' (Hancock 2019a).

### Gendered content

Some initiatives are targeted at particular genders. Several initiatives aim to empower young women. The *Health*

*Education and Relationship Training (HEART)* interactive web-based sexual health programme for girls in the USA aims to develop sexual assertiveness skills and sexual decision making. An evaluation found that participants ‘demonstrated better sexual assertiveness skills measured with a behavioural task, higher self-reported assertiveness, intentions to communicate about sexual health, knowledge regarding HIV and other sexually transmitted diseases (STDs), safer sex norms and attitudes, and condom self-efficacy compared with the control condition’ (Widman et al. 2018: 96). Some interventions aim to include all genders and make specific efforts to address the needs of young women. For example, *#ByeTaboo* sought out civil society groups advocating for women’s rights and LGBTI young people to review and approve content, and increase trust and promote use among these groups (Herbst 2017).

The literature search only yielded one intervention seeking to target young men. Lohan *et al.* (2015) describe an intervention for teenage men about unintended pregnancy, developed for delivery in the formal Relationships and Sexuality Education school curricula of Ireland, Northern Ireland (United Kingdom), and South Australia, based around a web-based interactive film drama. The intervention ‘aimed to engage men by disrupting stereotypes about men, while simultaneously addressing men through authentic voices and faces’ (*ibid.*: 1). Some interventions, such as smartSex, did not seek to target young men, but found majority male users. This reflects the gender digital divide, but smartSex sought to treat this as an opportunity to influence men: ‘men tend to be the initiators and decision makers of sexual encounters. This presents an opportunity to... challenge...gender-based patterns of entitlement/responsibility’ (Waldman *et al.* 2017: 32).

The literature search yielded no research on sexuality education for trans people. However, there is research on HIV education for trans people. Platforms for trans people largely focus on HIV and health. For example, the *Thai Ladyboyz* social networking site aims to promote health-seeking behaviour and mental health support for trans people, and *Siluata X*, from Ecuador, use social networking sites, email blasts and their website to promote trans rights and health (Allison *et al.* 2014). Increasingly, in the global North, platforms are emerging for young trans people to provide social and psychological support (e.g. Gendered Intelligence and Mermaids UK).

#### How can young people tell what information to trust?

Simon and Daneback (2013) found indicators of quality lacking (such as authorship and references), but found that adolescents are able to evaluate quality. Some say they trust websites that are well-known or have a good reputation. Whiteley *et al.* (2012) evaluated websites for ‘authority and credibility’ against criteria from the American Library Association standards for web evaluation (Tate 1999). Measures for assessing a website’s authority and credibility included ‘clarity of what organisation is responsible for the contents of the page, authorship... ability to verify the legitimacy of this organisation... clarity on whether the website is from a national or local chapter of an organization’ (Whiteley *et al.* 2012: 210).

Just as in non-digital sexuality education, there are competing ideas of what constitutes sexuality education, and what goals and values should guide content. In the USA, ‘crisis pregnancy’ websites seek to discourage women facing unintended pregnancies from having abortions. Bryant-Comstock *et al.* (2016: 22) systematic analysis of the content of these sites concluded that ‘Crisis pregnancy center Web sites provide inaccurate and misleading information about condoms, STIs, and methods to prevent STI transmission’. Yet crisis pregnancy centres and their websites are listed in several state resource directories, which might lend legitimacy to the information provided, and young people might find it difficult to discern inaccuracies in content given the implication of endorsement by official bodies.

Some sexuality information providers may win trust by establishing their ‘brand’. However, the extent and technical sophistication of fake news has developed and is becoming better known. How to ensure accuracy and credibility is a complicated question with no easy answers at present.

## 2.5 Gaps in the literature

Sexuality education and information in digital spaces has developed rapidly in recent years, and the research has not been able to keep pace. Gaps are evident in the literature. One gap is ‘The qualitative experience of adolescents engaging with sex information online’ (Simon and Daneback 2013: 313), for example, why are they looking, why online instead of offline, how do they look, and how do they use the information? Because these qualitative aspects of young people’s use are not known, ‘it is unclear whether online sex education replaces or supplements traditional sources’ (*ibid.*: 314).

Impact takes time and can occur in many ways. Studies on impact are challenged by the speed at which technologies change as well as by their general lack of theoretical framework. The two most obvious gaps are: research on impact of digital sexuality education and information in global South contexts; and research which combines quantitative methodologies exploring how far young people’s knowledge, attitudes or behaviour have changed, with qualitative methodologies asking them how and why.

Several authors cite a lack of systematic evaluations on impact (Dunne *et al.* 2014; DeSmet *et al.* 2015; Todaro *et al.* 2018). Dunne *et al.* state that future research should focus on the long-term use of technology to educate adolescents on STIs and the effect on prevention, early intervention, diagnosis, incidence, treatment, reoccurrence, and effects on patient behaviours. DeSmet *et al.* also cite the need for investigation of longer-term effects '... there is a need for more rigorous evaluations of game effectiveness (e.g. randomized controlled trials) that provide longer-term follow-up and assess behavioural measures, rather than solely determinants' (*ibid.*: 88). Widman *et al.* (2018) stress that more research is needed into the relative efficacy of technology-based interventions versus in-person interventions.

There was a notable absence of literature exploring age appropriateness content and how to manage this in the context of online spaces. Other demographic factors such as race are underexplored, as are issues such as how far any variations are due to difference in access or difference in interest (Simon and Daneback 2013). Gender identity and disability have also received inadequate attention. Demographic differences need more research so that resources can be better targeted to different audiences.

A striking gap is how digital sexuality education is affected by and can function within or challenge structures of power in the digital world. The economics of sexuality education, and how the digital landscape is affecting funding patterns and commercialization of services, has received almost no attention.

## Conclusion and recommendations

The literature reviewed in this paper is testament to the reality that the sexuality education landscape is changing. Digital spaces offer a huge opportunity for young people to learn about sexuality, both from content intended to educate and that which aims primarily to entertain. Digital spaces offer new possibilities for young people, including marginalised groups, to be reached, as well as to lead and influence creation and sharing of knowledge. At the same time, just as in offline spaces, stigmatising, bullying and coercion can take place, including sexual and gender-based violence.

Young people's engagement in 'digital spaces' is diverse and is gender- and context-specific. The dynamic nature of technology means that the platforms through which information and education is delivered is constantly changing. There are a plethora of platforms providing education and information in different shapes and forms, some of which are explicit about their intention to educate and others, such as influencer sites, less explicit but still widely popular. This, alongside the reality that few interventions monitor impact, and those that do have diverse content, goals, indicators and theories of behaviour change, and are measured at different times, make it hard to compare impacts or reach generalisable conclusions. However, based on the review of the literature, several conclusions are summarised below, along with a number of recommendations to guide future work to effectively harness the power of digital spaces to strengthen efforts to reach young people with quality education about sexual and reproductive health.

### Reaching and engaging young people

Young people all over the world are the most active users of digital technologies. This presents the potential to reach a huge audience with quality information and education. However, access is far from equal and while digital platforms offer an exciting opportunity to reach young people and deliver much needed information, special efforts are required to ensure that those with less access to technology or with lower bandwidth available do not miss out. Special efforts may be needed to reach particular groups such as girls, women, and young people with a disability.

Indeed, digital media has great potential to be designed to be relevant to and reach excluded groups such as young people in rural areas, young people with diverse sexual orientations and/or gender identities / expressions and/or sex characteristics, and young people with disabilities. However, digital media may also present obstacles in reaching these groups, due to stigmatising content, technological barriers and risks of exposure. This review found a lot of research focusing on interventions targeting young women and comparatively little targeting adolescent boys and young men, young trans people and young people with a disability. This suggests that such platforms are lacking.

### Influence and impact

Digital sexuality education can have impacts on knowledge, attitudes and behaviours. More evidence is available showing influence on knowledge. Evidence on longer-term attitude and behaviour change is scarce. What is clear is that digital sexuality education can be enjoyable and is widely found to be appealing to young people.

Creating opportunities for young people to help design initiatives can make them more responsive to young peoples' needs, as well as help young people develop valuable digital knowledge skills they need and desire.

Online interventions are thought to be more cost-effective and far reaching than offline, but this is difficult to quantify. Some studies try to compare school-based and digital sexuality education impacts. Many find digital education more impactful; however, comparisons are not meaningful if the content and quality vary (e.g. a great teacher is probably more impactful than a not-so-great digital game, and vice versa). Many interventions combine digital education with education in schools or other offline spaces and there is a need for further research to examine the potential of hybrid programmes that harness both online and offline methods.

### Opportunities and risks

Digital spaces offer new possibilities – including for marginalised young people – to influence the creation and sharing of knowledge. In places where there is ineffective or insufficient school-based sexuality education provided, digital spaces fill an important gap. In places where school-based delivery of sexuality education is provided, digital spaces are no doubt a value add. However, technological interventions should not be seen as a replacement for interpersonal education.

Digital spaces can be an environment where bullying and coercion take place, including sexual and gender-based violence. As the same time, they can provide opportunities to mobilise against violence and other social problems. Moderators can seek to create safe spaces in closed or controlled platforms, where young people's privacy or anonymity is protected. This is cost- and labour-intensive, raises questions about freedom of speech, and about young people's needs and rights to make up their own mind based on a variety of perspectives.

Digital spaces cannot be looked at in isolation from the broader digital context which is highly controlled and

politicized. However, understanding and holding to account the institutions of power in online spaces has its own particular challenges, as the regulation, accountability mechanisms, and advocacy around digital spaces struggle to keep up with the rapidly changing technological landscape.

### Content, standards and guidelines

There is huge diversity in content relating to sexual and reproductive health online although it appears that some topics are covered to a much greater extent than others. While there are a range of examples of platforms that take an explicitly 'sex positive' approach to content development and delivery, as with much offline sexuality education, content often focuses more on risk prevention and less on pleasure or wellbeing, despite a clear preference from young people for a sex positive approach.

There is no standardisation of content. Digital sexuality education currently includes a rich diversity of goals, content and audiences, and a range of accurate and inaccurate information. To date, no guidelines have been developed specifically for digital online sexuality education. Whether such guidelines would be practical or desirable is questionable, however, for those seeking to deliver content to a range of age groups, existing guidelines on comprehensive sexuality education (not specifically targeted to digital delivery) may be useful. Guidelines to assist content developers to implement safeguarding measures, while still remaining accessible and popular, may also be useful.

### Literature gaps

Literature in this field was predominantly by authors located in the global North, and about global North contexts. Targeted searches were done for literature addressing these gaps. Given the uptake of mHealth interventions, including those intended to educate in the global South, there is a need to invest in research in these settings.

While it is clear that digital sexuality education initiatives have attracted huge numbers of young people, there is limited research on qualitative experiences of how they engage online, for example who is engaging, their pathways for accessing these sites, why are they looking, why online instead of offline, how do they look, and how do they use the information? There is a need to invest in research which combines quantitative methodologies exploring how far young people's knowledge, attitudes or behaviour have changed, with qualitative methodologies asking them how and why.

## Recommendations

***Seek to empower young people with evidence-based, gender-transformative and positive digital sexuality education*** that deploys the digital modalities young people want. The research shows that many young people want information on pleasure as well as other kinds of information. It shows that digital sexuality education initiatives and other kinds of sexuality information influence and impact on young people; however, the existing research is limited in terms of understanding what kind of impact, and in exploring how different content and mediums relate to different impacts.

***Enable young people themselves, including marginalised groups, to lead, advise on and influence content and provision.*** On average, young people use digital spaces more frequently than older age groups. Their familiarity and skills in engaging with these digital spaces put them in a good position to take advantage of the social and technical possibilities which make possible new forms of knowledge creation and sharing.

***Work with content developers and owners to enable them to learn from the evidence informed, effective offline comprehensive sexuality education.*** While digital interventions differ from face-to-face interventions, evidence from the offline world can help to inform the design of online education platforms in terms of comprehensive content, and methods of delivery that shift knowledge, attitudes and practices. Learnings from the offline world can also highlight the benefits of taking a sex positive perspective.

***Digital and non-digital can complement each other, in sexuality education initiatives as well as more broadly.*** Digital sexuality education, including initiatives run as part of school-based programmes, is generally reported to be enjoyable. Young people do not necessarily distinguish between the material and virtual worlds, and live their relationships across both. Education in both spaces can address this integration.

***Design interventions around the everyday technology practices of audiences in the particular context and prioritise the digital privacy of users.*** For example, in contexts where young women are using shared devices that they can only access through gatekeepers such as male relatives, it may not be appropriate to target them with what is considered to be sensitive information.

***Tackle the risks of cyberbullying and sexual and gender-based violence in digital spaces.*** This includes understanding the inequalities and risks faced by young people of different genders in different contexts, and designing interventions appropriately. In some contexts, this means recognising (for example) that girls may not feel

comfortable accessing public-facing SRH content through social media platforms. It requires challenging the gender stereotyping in sexuality education content and beyond, and working to make online spaces more inclusive of LGBTI people and other marginalised groups. It means creating safer spaces online through moderation and safeguarding, and capitalising on the opportunities digital spaces present to mobilise against violence.

**Navigate the changing political context.** Online sexuality education is situated in transnational spaces – sharing languages, identities, and accessibility from diverse geographies, although the sexuality educators themselves may largely function within national sovereign territories. Sexuality educators are directly affected by the global political context of rising populist nationalism and neo-colonialism in the global North and South. Those working to deliver sexuality education in digital spaces need to strategise carefully to navigate these forces. **Seek to understand and hold to account the power structures of the digital world**, such as the state, religious authorities, and relatively new players such as Google, Facebook, Baidu and WeChat. At some moments and in some spaces, these institutions can enable and become partners, while at other times they need to be challenged or resisted. Sexuality educators need to critically examine their own position in relation to these structures, and to work out how they can contribute to a more accountable digital space and a more empowering youth-led digital sexuality education, without putting themselves or users at risk.

One dimension of the understanding needed is to **analyse funding trends for digital sexuality education**. Is the shift to learning through digital means part of a shift towards commercial funding of sexuality information? How is commercial engagement affecting content? These are questions that those working to deliver sexuality education in digital spaces need to explore, individually and collectively.

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