

Diversity in interactive media use among Dutch youth.

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Abstract

The intensive use of interactive media has led to assertions about the effect of these media on youth. An increasing number of studies refute these assertions. Despite the enrichment of the debate with empirical data, current research tends to focus on computer and Internet use and skills. Elsewhere we argued that research shouldn't look at the use per se, but rather at the ways interactive media function in young people's activities from the perspective of a changing society. This perspective allows describing possible consequences of societal tendencies for young people's everyday life; it allows describing the social and cultural functions of interactive media as part of young people's behaviour and systems of values and beliefs. This paper presents a quantitative study on the social and cultural functions of interactive media in young people's lives. Rather than following the assumption of a homogeneous generation, we investigate the existence of a diversity of user patterns. Results from a pilot-study show that contemporary youth can be divided into categories of interactive media use and of interactive media users. These results call for a better understanding of these categories and the characteristics of their members. The research question for this paper by result can be formulated as: *Can patterns be found in the use of interactive media among youth?* We answer this question by a survey among Dutch youngsters aged 9-to-23. The respondents were all students in education levels ranging from primary education to higher professional education. Four clusters of interactive media users, namely Traditionalists, Gamers, Networkers and Producers were identified using cluster analysis. Four clusters of interactive media use, namely browsing, performing, interchanging and authoring were identified as well. Behind these straightforward clusters, a complex whole of user activities can be found. Each cluster shows specific use of and opinions about interactive media. This allows for studying the intricate relationship between youth culture, interactive media and learning. With our analysis of both a) use and b) opinions and preferences, our study provided a deeper understanding of the social and cultural functions of interactive media. Furthermore this study revealed the existence of a diversity of interactive media users, rather than one uniform group, as is often assumed in the literature.

Keywords

youth culture, interactive media, games, user patterns, survey

Introduction

The suggested arrival of a new generation of learners is glossed under terms such as 'Net Generation' (Tapscott, 1998), 'Millennials' (Howe & Strauss, 2000), 'Digital natives' (Prensky, 2006) or 'Webgeneration' (Hartmann, 2003). Results of empirical research increasingly counterbalance the image of a generation being distinctive with regard to its use of interactive media. This image has influenced participants in the Net Generation debate to approach contemporary youth as a homogeneous group that uses interactive media, consisting of games and Internet applications, with great intensity and skill (Bennett, Maton, & Kervin, 2008).

Based on a growing number of empirical studies, the generation issue as a premise can be seriously questioned. In these studies it was found that young people have intermediate rather than high ICT-skills (Cameron, 2005; Margaryan & Littlejohn, 2008), their internet use is characterized by "relatively mundane forms of

communication and information retrieval" rather than "spectacular forms of innovation and creativity" (Buckingham, 2008, p. 14), and although they use interactive media intensively (Schulmeister, 2008; Duimel & De Haan, 2007), there appears to be a diversity in kinds of media being used (Ito, et al., 2008; Kutteroff & Behrens, 2008). These results do not point in the direction of a net generation as one homogeneous group.

Often, the net generation debate is motivated by a concern about the relationship between young people, interactive media and education (cf. Oblinger & Oblinger, 2005; cf. Shaffer & Gee, 2005). Buckingham (2008) speaks in this respect of a *digital divide* between in-school and out-of-school use, which he sees as a symptom of the "widening gap between young people's everyday 'life world' outside school and the emphases of many educational systems" (Buckingham, 2007 as cited in Ito et al., 2008, p. 4). The Net Generation debate is valuable for education, because it provides a framework to pose questions and make decisions regarding the application of interactive media in organizing and stimulating education. Despite the enrichment of the debate with empirical data, current research tends to focus on computer and Internet use and skills (Bennett, et al., 2008; Margaryan & Littlejohn, 2008). Elsewhere (Van den Beemt, Akkerman, & Simons, 2008) we argued that research shouldn't look at the use per se, but rather at the ways interactive media function in young people's activities from the perspective of a changing society. This perspective allows describing possible consequences of societal tendencies for young people's everyday life; it allows describing the social and cultural functions of interactive media as part of young people's behaviour and systems of values and beliefs. Interactive media can serve as tools for communication with others, or for developing knowledge and opinions about the world. Thus, the social and cultural functions are reflected in friendship-driven and interest-driven genres of participation (Ito, et al., 2008). Both genres of participation add to the development of both identity and informal networks among students. The functions of interactive media in everyday life are considered here as the motives for types of interactive media use among youth. It is important for education to take these motives into consideration when applying interactive media, especially when networked learning is concerned, because we believe in the increasing importance of socio-cultural values for students (Drotner, 2008; cf. Roth & Lee, 2007).

Research on people's motives should start with investigating people's behaviour: what are people's social actions? The investigation of young people's use of interactive media often begins with pre-defined classes of activities such as 'information retrieval', 'social networking', 'online gaming' or 'downloading' (Kutteroff and Behrens, 2008; Duimel and De Haan, 2007; Livingstone and Bober, 2005). Despite the usefulness of these classifications, the relationship between these classes of activities remains unclear. Investigating this relationship is valuable, since youth culture studies show that young people use combinations of available content and media to show others what they think is important (Weber and Mitchell, 2008). Profile pages for instance, often show images of their owners merged with photographs of pop stars or sportsmen. This *bricolage* (Lévi-Strauss, 1962) of different kinds of both content and interactive media can be studied by looking for patterns in the activities. Does online gaming go together with information retrieval or social networking? Can a convergence of media activities be found, or is there a divergence into separated user groups? Studying the relationship between activities is important for a better understanding of the social and cultural functions.

Following Ito et al. (2008), we argue that investigating solely a possible diversity of media activities would lead to a limited view of the intricate relationship between young people and interactive media. Therefore we operationalise the social and cultural functions of interactive media by investigating patterns of use and opinions about these media. We expect that a classification of activities as well as of users will appear from the results. Considering both the class of grouped activities and the class of grouped users allows us to study possible consequences for education of intensive interactive media use by young people. For instance, if our results would show that most students appear to be networkers with a negative attitude towards gaming, educators could consider using social software instead of games as a learning tool.

In earlier research (Author, 2008), we studied the interactive media behaviour of a small group of students in the Netherlands ($N=178$, aged 10-to-25). This study showed that our participants used interactive media intensively but not in a unified way. Rather, they showed diversity in behaviour, which can be expressed in user patterns. These results suggested a need for further research with a larger sample and about the position of interactive media in young people's daily life. This paper presents the results of this research and it aims at describing the interactive media behaviour among youth and their stated opinions about these media. In order to investigate user activities and opinions we formulated the following question: *Can patterns be found in the interactive media activities and opinions of young people?* The answer to our question forms the foundation for describing a diversity of subcultures based on the social and cultural functions of interactive media in young people's lives.

Method

The study sample consisted of 2138 Dutch students, in education levels ranging from primary education to higher professional education (see Table 1 for an overview of participants). The survey was conducted at twenty-four schools in six different regions of the Netherlands.

Table 1: Participants

Education level	Age (M)	Number of participants	Male	Female
Primary Education	9-13 (11)	640	321	319
Secondary Education	12-18 (15)	1.175	561	614
Higher professional Education	17-23 (20)	323	223	100
Total		2138	1095	1043

The online survey consisted of twenty-five questions addressing actual use of interactive media, opinions about the use of specific media and preferred media for contacting others. Each item referred to one of all interactive media currently used in the Netherlands. Answer categories followed a five-point Likert scale ranging from 'never' to 'every day' for activities and 'totally disagree' to 'totally agree' for opinions. Means of three and larger indicate respectively a regular use and positive opinion. Because the strongest response was expected for in- and out-group behaviour, games and social software, mainly opinions on these topics were asked for.

The questionnaire was developed by incorporating key characteristics of subcultures (Brake, 1985) and existing media research (Duimel and De Haan, 2007). The survey was preceded by a 'think-aloud' session (Van Someren, Barnard, & Sandberg, 1994) with three primary education students, to control for comprehension of the questions and for the time required to fill in the survey. The results of this session led to minor adjustments in the phrasing of questions. All respondents of the online survey received textual instructions that explained the purpose of the survey, that it would not be graded, and therefore that any answer would be right. Furthermore, the students were asked to fill in the survey at their own comfortable speed. Most schools arranged for each class to fill in the survey in a computer laboratory with Internet access. The survey was held between October 2008 and February 2009.

The statistical analyses were performed in several steps. First, cluster analysis was applied to explore the existence of categories of media activities. In order to do so, Ward's method with squared Euclidian distance and z-scores was applied based on items of activities from the questionnaire. This resulted in a pattern of related activities. Cluster analysis with the same method was applied on the cases to find a pattern of related interactive media users. With a one-way ANOVA the significant difference in means between the categories of activities and users was checked. Levene's test of homogeneity of variance showed a $p < 0.05$ for all clusters. Because of this violation of homogeneity of variance, the Welch F-ratio is reported in the results section. Furthermore the Games-Howell method was used for post hoc comparisons. Following existing research (Duimel and De Haan, 2007), application use of at least once per week is considered as 'regular' use. Categories of opinions were derived from cluster analysis on items, applying Ward's method with squared Euclidian distance and z-scores. Again a one-way ANOVA was applied. Because the assumption of homogeneity of variance was violated, the Welch F-ratio is reported and the Games-Howell method was used for post hoc comparisons. In the results section we will describe the main conclusions from our analysis.

Results

Our data show diversity in the use of interactive media applications ranging from social software, such as Hyves¹ or Facebook, to games or video-websites, such as YouTube. All respondents reported making use of at least one application once per week or more. This means that there are no non-users in our sample.

¹ Hyves, a website resembling Facebook, is the most popular social networking site in the Netherlands at this time.

Diversity in interactive media use and users

Cluster analysis applied on the use interactive media applications revealed four significant clusters in the behaviour of our participants. These clusters are an indication of diversity in interactive media use. One cluster consists of e-mail, surfing the web, searching for information, MSN and watching videos. Because these are traditional, more basic Internet activities, focused on the consumption of information we labelled them 'browsing'. A second cluster, consisting of gaming activities, is a form of interest-driven participation (cf. Ito et al., 2008) where users play a certain role on a virtual stage. We labelled this cluster 'performing'. A third cluster can be called friendship-driven, and consists of all kinds of social networking activities. We labelled this cluster 'interchanging'. The last cluster consists of a larger number of activities, all of them comprising some form of interactive content production in line with Jenkins (2006). We labelled this cluster 'authoring'.

The four clusters found by our analysis, do not describe the respondent's membership of specific clusters. A second round of cluster analysis was applied to investigate how the clusters of activities related to individual participants in our sample. This resulted in four clusters describing types of media users. We labelled them according to the main activity group in each user cluster: Traditionalist, Gamer, Networker and Producer.

A one-way between subjects ANOVA, followed by post hoc comparisons were conducted to compare the activity clusters for each user cluster. The results of these analyses suggest that a relation exists between membership of a certain user group and kinds of activities people participate in. The intensity of participation applies especially to browsing activities. Specifically, our results suggest that Producers and Gamers both engage in a similar way in gaming activities, while Networkers appear to engage significantly less in gaming activities. Networkers and Producers are equally active in networking, while Traditionalists and Gamers are significantly less active with interchanging. Finally, our results suggest that only Producers are significantly active with authoring compared to the other user clusters. This makes Producers the most dedicated users of their own applications, next to being the most intensive users of all kinds of interactive media.

Cluster membership, gender and education level

Following the gender issue in the Net Generation debate, we analyzed the division of user clusters among boys and girls. Table 2 shows that 64.5% of the Traditionalists are boys, while 61.1% of the Networkers are girls. For the Gamers the gender division is almost equal, while 56% of the Producers are girls. The Networkers' population follows traditional ideas about girls being more engaged in peer-to-peer communication. However, we also see that contrary to popular belief, games are no longer boys' territory.

Table 2: Gender - percentage of cluster membership

Gender	Traditionalist	Gamer	Networker	Producer
Boys	64.5	49.4	38.9	44.0
Girls	35.5	50.6	61.1	56.0
Total	100	100	100	100

It is noteworthy to look at cluster membership and educational level, because these levels, and therefore the age groupings as well, are not equally spread among our sample (see Table 1). The largest percentage of Traditionalists and Gamers are found among primary education pupils. Pre-university students form the largest group of Networkers, while the higher professional education students and the lowest vocational level students form the largest groups of Producers. On average, within each educational level Networkers account for the highest percentages of users. This makes networking the most important activity among today's young people. Summing up, these results show that while two-third of the Traditionalists are boys, and two-third of the Networkers are girls, gender is equally spread among Gamers and Producers. Traditionalists are primarily found among education pupils, and least among the (pre-) vocational level. Networkers are mainly equally spread among the levels, apart from the primary education and pre-vocational levels. Gamers are as well evenly spread among the levels, apart from primary education and the pre-university level. The least number of Producers can be found among pre-vocational students, and most among students in higher professional education.

Although analysis showed a grouping of activities in four clusters and a grouping of respondents in the clusters Traditionalist, Gamer, Networker and Producer, there appears to be a complex whole of activity-user combinations, rather than a straightforward one-to-one mapping of clusters. Instead of each cluster of users engaging solely in their 'own' kind of activities, the means for activities show that all groups engage in a number of browsing activities as well. Furthermore, Producers engage in performing and interchanging activities.

Each user cluster, together with the opinions expressed by its members, forms a pattern of interactive media use. In order to get a clear view on these patterns, we will discuss each cluster in terms of intensity of media use, differentiation on age and education level and acknowledged importance of media.

Traditionalists

The Traditionalists form one group of respondents. These respondents use the basic functionalities of interactive media rather than web 2.0 applications. This might explain the large percentage of primary education pupils. Members of the other clusters use applications such as MSN, e-mail or search engines as well, which is shown by relatively high means for these activities. However, the other clusters do this in combination with specific gaming, networking or production activities. The basic aspect of traditionalists explains why they on average have no strong opinions about media activities. As we can conclude from opinion 2 and opinion 5 in Table 7b, of all the clusters, Traditionalists appear to be least depending on MSN. This is enforced by the acclaimed importance of MSN for contact with friends. Using MSN to show to others what is interesting or to find out about others is reported to be not very important to Traditionalists. In general terms, these results show that Traditionalists are not intensive users of their own media and do not have strong feelings about these media.

Gamers

Gamers engage in all kinds of gaming activities. Gamers, of all clusters, have the strongest feeling of wanting to belong to a group. They combine this with a reported preference for playing together with others. Gamers have the highest mean of all clusters for opinions about games. However, low mean-scores indicate that Gamers do not have strong opinions about gaming aspects. The only exceptions to this rule are 'I enjoy games because they give me the chance to experiment', and 'I enjoy games that learn me something new'. Gamers on average do not feel unhappy if they cannot play games. Gamers on average like to use games to show what is interesting, although they think positive about YouTube as well. In general, Gamers are reasonably intensive users of their own media. They combine this with a rather positive opinion about gaming aspects, and an acclaimed importance of games for showing their identity.

Networkers

Networkers make use of all kinds of social software. In our sample this means mainly a simultaneous use of several Hyves functionalities and MSN. Profile sites, such as Hyves, are being maintained regularly by on average one-third of all young people in secondary education. Most active maintainers of Hyves pages are higher education students. Of all education levels, PE-pupils most often do not 'own' a Hyves page or any other profile page. This is for the larger part explained by the 10-year-olds.

On average, half of our sample responds regularly to profile pages of others. Owners of profile pages spend more time maintaining their own page than looking at or responding to pages of others. Networkers are on average the most different from gamers. For instance they feel least unhappy when they cannot play games, and they think least positive of using games for showing their identity. Of all the clusters Networkers are most unhappy when they cannot be on Hyves, although the means is low, with a reasonable standard deviation. Hyves is on average reported to be important for contacting friends combined with MSN. The Networkers mean scores for using Hyves for showing interesting things and for finding out about others, are close to those of Producers. These results show that networking activities are almost equally important among all educational levels. Opinions about Hyves are on average not strong among Networkers, although they think their media are important for contacts with others. Networkers show a low interest in games. The same counts for Gamers in relation to networking activities.

Producers

Producers form a cluster with very active users of many kinds of interactive media. They have positive opinions about a diversity of media; only a letter is on average not preferred for contacting friends. They combine this with rather strong opinions about all media, apart from games. The group of Producers might relate to the definition of the Net Generation as found in literature. For a multitude of activities and opinions about these activities, Producers have high mean scores, often higher than the sample means. They also have high means for using their own media, such as Myspace, forums or YouTube, to show and find out what is interesting. Although Producers form less than ten percent of the population, it might be interesting for further analysis to look closer at other characteristics of this group. One can think of possession of interactive media hardware, ICT-skills or number of 'friends' made with social software or in online communities.

Discussion

In this paper we investigated the existence of patterns in young people's use of interactive media. Our results show a diversity of user patterns rather than a homogeneous use of interactive media. We found groups of young people who reported making intensive use of interactive media. This intensity goes together with a diversity in kinds of media and in opinions about specific media activities.

We distinguished four clusters of interactive media activities and labelled them following current literature: browsing, performing, interchanging and authoring. These four clusters form one dimension of activities ranging from consumption (browsing) to production (authoring). Furthermore, we distinguished four clusters of interactive media users. We hypothesized these user clusters as different subcultures (Van den Beemt, et al., 2008) and labelled them respectively as 'Traditionalists', 'Gamers', 'Networkers' and 'Producers'. Each user cluster relates to a specific activity cluster: Traditionalists to browsing, Gamers to performing, Networkers to interchanging and Producers to authoring. However, most cluster members engage in other activities as well (see Fig. 1). Hence these user clusters form a second dimension ranging from consumption (Traditionalists) to producing (Producers). In short, Traditionalists only make use of the basic functionalities of interactive media, that we labelled as 'browsing'; Gamers appear to be content-driven participants, prefer playing together and enjoy the production and pretending aspects of games; Networkers appear to be friendship-driven, focused on communication with peers and combine the use of their profile pages with MSN; Producers appear to come closest to the net generation with a diverse and intensive use of many interactive media for both production and interactive consumption of content, including media typical for the other user-clusters. Producers appear to be both content-driven and friendship-driven participants.

	Traditionalists	Gamers	Networkers	Producers
browsing	x	x	x	x
performing		x		x
interchanging			x	x
authoring				x

Figure 1: Relations between clusters of users and activities

The dimension of activities together with the dimension of users clarify the importance of interactive media in the shaping of connections among young people, and thereby indicate the motives for using these media. These motives, operationalized as the social and cultural functions of interactive media, are important for the development of education for contemporary students that takes into account the diversity among these students.

Because our current sample was not drawn randomly, some results indicate a need for further research with supplementary analyses. For instance, our results show a high percentage of Producers among higher education

students. The large number of multi-media students among the higher education respondents could explain this. The same applies to the large percentage of gamers on primary education level. Both results appear to be an issue caused by the sample characteristics, rather than an effect explained by educational level. Educational level and gender appeared to significantly influence the respondents' opinions about specific media. This suggests a need for multilevel analysis in order to explore these macro level interactions.

A number of surveys among university students with a focus on ICT skills in relation to learning (Cameron, 2005; Margaryan & Littlejohn, 2008; Jones, Ramanau, Cross, & Healing, 2009) support the inclination of a differentiation based on user patterns. None of these studies found evidence to support the claims regarding students adopting radically different patterns of knowledge creation and sharing, as suggested by some previous studies. Our results endorse these findings, not only for higher education, but for a wide range of education levels as well. The patterns we found in both use of and opinions about interactive media show that young people give meaning to interactive media in diverging ways instead of as a homogeneous group. Some media, such as MSN or Hyves are widely used, but with different levels of intensity and having different meaning to the users. This diversity relates closely to both education level and gender: Traditionalists are largely found among primary education students, which can be explained by the higher level of technology understanding required by newer kinds of interactive media. This result can be interpreted as such that primary education would be a good moment to introduce web literacy to students. Gamers are evenly spread among boys and girls, which shows a nuance to the general image of gamers being boys. Networkers are most often girls, which follows the presumption of girls being more communicative and focused on peers. This result can be interpreted in two directions: either social software can best be applied in classes consisting mainly of girls, or using social software can teach boys to become better networkers. The membership of clusters, influences the opinions about and preferences for interactive media. All participants have a preferred attitude towards their cluster's media. Networkers and Gamers both show the least appreciation for each other's media. This last result indicates that combinations of games and social software as learning tools should best be avoided.

This diversity implies caution in drawing conclusions about interactive media and young people, especially when interactive media and education are concerned. The small percentage of Producers among the respondents indicates that, although most of today's youngsters engage in traditional activities, not all of them are active in interactive media production. By result it is not self-evident that all students' learning improves by using convergence media such as YouTube, Flickr or Facebook.

An important unexpected outcome was the complex relationship between behavioural dimensions. These dimensions clustered groups of activities, but they did not relate in a straightforward way to clusters of users. This outcome shows that young people have diverging ways of giving meaning to interactive media, rather than them behaving as a homogeneous group.

By means of statistical analysis we defined the clusters of users and activities. This is a specific representation of reality. Further research should therefore enhance these results by having respondents explain in their own words the social and cultural functions of interactive media. In line with these results we are currently conducting a qualitative study on these functions.

With this paper we added an image of diversity among young interactive media users to the Net Generation debate. This diversity in both use and users clarify the social and cultural functions of interactive media and by result provide an insight into young people's motives for using these media. Knowledge of these motives is important for a directed development of education, while taking into account diversity in use of and preference for interactive media among contemporary students.

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