



<http://www.diva-portal.org>

This is the published version of a paper presented at *The ACM CHI Conference on Human Factors in Computing Systems, April 26 - May 1 2014, Toronto, Canada.*

Citation for the original published paper:

Juhlin, O., Engström, A., Önnvall, E. (2014)

Long Tail TV revisited: From ordinary camera phone use to Pro-Am video production.

In: *CHI '14 Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 1325-1334). New York: Association for Computing Machinery (ACM)

<http://dx.doi.org/10.1145/2556288.2557315>

N.B. When citing this work, cite the original published paper.

Permanent link to this version:

<http://urn.kb.se/resolve?urn=urn:nbn:se:su:diva-106144>

Long Tail TV revisited: From ordinary camera phone use to Pro-Am video production

Oskar Juhlin, Engström
Arvid, Örnevall Elin

MobileLife@Stockholm
University

[oskar, arvid,
elino]@mobilelifecentre.org

ABSTRACT

Pro-Am live video producers broadcast events on a regular basis. They are here selected for an ethnographic study since their continuous content generation can teach us something of what it takes for amateurs, who currently struggle with mastering the video medium, to become proficient producers. We learn from media theory that Pro-Ams are distinguished from professionals in terms of inherent skills and identities, and have therefore focused on these characteristics. We add to this research by showing on-going challenges that the former face in their production, i.e. how their learning practices, such as learning through instructions, are situated and related to particular settings. Learning and development of skills were done as organizations, rather than as individuals. Furthermore, the recurrent nature of both events and broadcasts appears to be an important condition for establishing the terms needed to carry out a production, and to learn the skills of a producer. This understanding may explain in part why accounts in previous research, of single users struggling with the affordances of live video, point to such difficulties in mastering the medium. The findings guide design to better support activities contiguous with the set-up of the production, rather than the broadcast per se.

Author Keywords

Video, Camera phones; Ethnography; User-Generated Content; live video; pro-am; learning; organization theory; media studies; identity; mimicking; negotiation

ACM Classification Keywords

H.5.m Information interfaces and presentation (e.g., HCI): Miscellaneous

INTRODUCTION

The ubiquity of camera phones and consumer-level digital cameras has brought great anticipation in the public discourse of how new video services and new forms of use would emerge and become everyday practice [37]. News

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for components of this work owned by others than ACM must be honored. Abstracting with credit is permitted. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee. Request permissions from Permissions@acm.org.

CHI 2014, April 26 - May 01 2014, Toronto, ON, Canada
Copyright 2014 ACM 978-1-4503-2473-1/14/04...\$15.00.
<http://dx.doi.org/10.1145/2556288.2557315>

coverage has incorporated high profile examples of videos captured by bystanders to illustrate breaking news reports from events around the world [1], as well as more negative discussions of privacy implications of video capture “anytime and anywhere” [30,19].

Anderson’s concept of “Long Tail” TV-content describes the phenomenon of niche content becoming increasingly available and in demand, as the costs for production and distribution fall, and content that “...is not available through traditional distribution channels but could nevertheless find an audience” [3]. Apart from old or non-mainstream TV shows getting an extended life cycle, through on-demand programming, he also includes “video that could and would be made if only there were a good way to find an audience for it.” [3]. At the time this was written, there were only indications of what this far end of the tail would contain. With time, we now see more distinct categories of video services forming. On the one hand, there is everyday “snapshot” video captured and shared mostly with groups of friends, and on the other hand more niche services for advanced user-generated video production, as seen in commercial development and research. The concept draws on a growing category of amateurs who aspire to meet professional standards in various forms of media production. This emerging category has been labeled Pro-Ams (for Professional-Amateurs) [28], and has been described in contemporary media studies, in terms of their motivations and the varying skills they possess [6,37]. It is the challenges in achieving these skills that will be discussed in this paper.

In HCI research, mobile video has received a substantial interest, such as in work describing the characteristics of mobile video use [26,30,35], investigations of new features and specific use domains for the next generation of user-generated mobile video [17,10,8,13,44]. As a counterweight to the anticipation of Pro-Am video, Lehmuskallio et al., in a key study of everyday mobile video use, point to a slower and much more mundane development [30]. In their study of early camera phone use, they find that people model their mobile video capture on snapshot photography, rather than imitating professional media and the novel and high profile uses proposed in the public discourse.

Adopting mobile video in the more production-oriented sense, beyond snapshot video, is far from trivial. Previous research has identified a number of characteristics that make video production challenging. The need for editing

material before presenting it is a burden; the majority of user-created videos are never edited [30,26,46]. Finding relevant content and capturing it in the moment is problematic [23,30]. Visual storytelling in video is challenging and involves skills that until recently were exclusive to the professional domain. Video-specific controls, e.g. beginning and ending a clip smoothly, require more effort than e.g. taking a photograph [17,23,30,46]. In addition, filming requires a focus that may take attention away from attending an event [17,30]. With live video, these problems are emphasized further, as production decisions become increasingly time critical [23,22].

This paper is built on the premise that: a) a smaller subset of users are candidates for adopting more advanced mobile video production services e.g. those proposed in HCI: b) there are real problems that non-professional adopters of these technologies have to overcome to become video producers. Some of these problems for individual users are described in research, but there is a lack of understanding of how aspiring video producers manage these problems, and develop new skills within existing social settings.

We will here present an ethnographic study of three independent video producers who recurrently produce and broadcast live video from various sports events such as modern dance, volleyball and soccer.

Rather than viewing ProAm producers as having a set of individually contained characteristics, we will here view it as a transitional category, where aspiring producers are practically working on acquiring the necessary skills. In doing so, we draw on recent theory on learning, to unpack how production skills and being acknowledged as a producer are intimately related and develop over time. Our analysis of Pro-Am video production reveals both members' learning practices and a more social, heterogeneous and situational form of knowledge acquisition. The key contribution can be summarized in two points. First, the skills of aspiring video producers are developed organizationally and individually, both within the production teams and in negotiations with others in the context of the covered event. Second, recurrent production where producers cover a series of events over time, seems to be more than a quantitative sign which indicates that they are able to master this media. Rather their focus on recurring events seems to be an important condition for both individual and institutional learning, which makes the broadcasts possible.

In combination, this understanding may explain in part why accounts in previous research, of single users struggling with the affordances of the live video, point to such difficulties in mastering the medium. It also points to interesting directions for design, and especially the way learning could be improved by finding new ways beyond copying professionals cameras equipped with the classic red tally light into e.g. camera phone applications.

BACKGROUND

Our analysis and is influenced by three strands of research i.e. research on human computer interaction with video; media studies analysis of the mechanisms, including skills and motivation, that drive Pro-Am production, and finally theories on knowledge development in pedagogics.

User-generated video in HCI

The term “snapshot video”, used by Lehmuskallio and Sarvas in their study of early camera phone use [30], accurately anticipated what has grown to be common user behaviours in mobile video. In their study, they find that people model their mobile video capture on snapshot photography, rather than imitating professional media and the novel and high profile uses proposed in the public discourse. Years later, their proposed design implications – simple editing, quick browsing, summarization and restricting the length of shared videos – may seem obvious in the light of available features in today’s services. But the services that are now gaining broad adoption (e.g. Instagram Video, Vine and Viddy), clearly prioritize precisely these types of features focusing on sharing with close friends, ease of use and aesthetics over advanced features such as publishing, multicamera collaboration and live broadcasting. In the race the future success story of mobile video, these services have closely modeled themselves on snapshot mobile photography, which is evident from their focus on features such as aesthetically appealing filters, one-click sharing on social networks enabling the type of “distant closeness” Van House observed in photo sharing [40], and tight limits on clip length (6 and 12 seconds for Vine and Instagram, respectively). This supports Lehmuskallio et al:s concept of “snapshot video” being the key type of use for a large majority of users, with only a gradual change to more “professional” or “production-oriented” practices.

On the other hand, HCI research has presented convincing cases for such production-oriented uses for a smaller niche of more advanced users such as local producers or enthusiast visitors at live events [17,13,8] and in specific use domains such as emergency rescue [10], and education [44]. The contrast of these proposed technologies to more mundane video sharing practices points to two main directions for user-generated mobile video production; a broader use of “snapshot video”, while the more advanced technologies proposed in research realistically will be targeting a smaller subset of the growing masses of camera phone users, closer to the niche producers of “Long Tail TV”.

Media studies on Pro-Ams' skills and motivation

Media theory has taken an interest in the emergent area of Pro-Am production, and especially in understanding what it takes of people involved. Since knowledge and motivations are seen as something an individually contain, they can also be discussed separately. First, Pro-Am producers are seen as carrying a specific set of skills, which deviates from the

way professional categories have been defined by scarcity of production tools rather than unique skill sets [37]. The wide dissemination of digital production technology has blurred these categories and brought a range of content that does not easily fit the one or the other [12]. At the same time, views on amateur production tend to be skewed towards the notion of users' lack of professional expertise and knowledge. The distinction between them often focuses on possessing skills and being a competent practitioner [24]. Professionals are often seen as possessing exclusive domain knowledge, while amateurs are seen either as inept, or having romantic qualities of authenticity. The successes of early amateur production projects were surprising and difficult for some of their counterparts in the more traditional media business to fully explain. Benkler [6] argues that viewing them as curiosities or transient fads misses the bigger picture i.e. a new mode of production emerging in the margins of the most developed production systems in the world. While people do act for material gain, they are also driven by a diverse range of other motivations. In their work on commons-based peer production, Benkler et al. [7] argue that the set of motivations is one of the key characteristics of these new production forms. They are made up by social cues and motivations, rather than monetary compensation or commands, as traditional production is organized. These motivations can be structured in a number of virtues or attributes that participants adhere to, divided into four broad clusters. First, a group of attributes related to autonomy and independence has been a driving force in e.g. the open source programming movement, operating outside of the industry. Second, creativity, productivity and being active in engaging in one's interests make up a key theme. Third, many peer production projects arise from charity and altruism, speaking to participants' desire to contribute to a good cause. Fourth, and thematically related to the third, is social connectedness and a sense of membership. This involves the conception of the self as being part of a community and contributing to a collective effort. The sense of belonging to a community seems to be an over-arching motivation, but the other motivations for participation are highly individual, and often change over time [27]. The first two clusters reflect personal aspirations, while the second pair is inherently social in nature. Benkler and Nissenbaum [7] conclude that social motivations reinforce personal ones; they are rewarding in themselves as well as helping participants be autonomous and develop individual skills. The support for both personal and social motivations, and the fact that participants can join a project with any one of these motivations, are success factors in peer production.

In his work on online culture, Shirky [37] argues that these clusters of motivations – desires for autonomy and creativity, social connectedness and generosity – are intrinsic motivations that people possess in varying combinations, and people will gravitate to experiences that reward them. The motivations are not new, but the activities associated

with them used to be largely private, such things as making home videos, playing in a band, or collecting photographs. The new practices of amateur production in the public sphere can be seen as an extension of these activities with a number of important constraints removed; finding likeminded peers, organizing socially beyond small groups, producing content collaboratively, and distributing content to other people on a large scale.

In sum, the approach taken displays an understanding of this group of media producers as containing a set of characteristics, which they bring into use when creating media. Their specific competence or identity explains the character of the resulting media. At the same time, media theorists also describe Pro-Am production as an evolving entity where the participants learn by doing productions of various sorts. In this perspective, something seems to happen in production, and the sum of the activities would not be reducible to motivations and skills they contained when engaging in an event. What is missing in this research, which we need to understand to discuss the possibilities of amateur video production in particular, is accounts of the challenges that faces Pro-Am in on-going production.

Theories of learning and identity

A body of literature within pedagogics understand skills and identities as characteristics of individuals [2, 18, 39], similar to the perspective outlined above [7]. Lately, research has emerged that extends this understanding by recognizing features in learning as emergent, also being linked in a complex way to an individual identity, social interaction, situations and institutions.

First, the development of skills is connected to the feeling of being someone. Learning creates an inner dialogue [21] forming a connection between skills and identity. The feeling of mastering or understanding something creates personal development as various tools become manageable. Second, learning depends on social agreement including power struggles, which define learning situation "for self and others [2]." A person's own definition of their learning, practice and identity is therefore also dependent on how others interpret it. Murphy and Hall [32] believe that "learning and knowledge can be understood as the relationship between people in a certain activity and learning." Wenger [45] suggest that "knowing / knowledge is shaped by a kind of negotiating with the other." Third, development of skills is a gradual process which is tightly connected to the environment: "...their interaction is characterized by a clear division of labor tied to their positions as teacher and student, or, more specifically, instructor and instructed [31]." Learning by doing is interactionally dependent on the physical setting, as well as how the learning unfolds. Taken together, we can see learning as "a movement deeper into practice, and as a transformation of identity, where identity is understood as evolving forms of competence [31]". Fourth, learning can be understood as done by institutions and organizations [20]. Learning is then understood as be-

ing“...undertaken by members of an organization to achieve organizational purposes, takes place in teams or other small groups, is distributed widely throughout the organization and embeds its outcomes in the organization’s system, structure and culture [9].” Engeström [16] refers to the learning of an “activity system” where all work within a group, or organization, is formed by rules, cultural artifacts (e.g. meetings and physical artifacts like computers). The organizational approach brings with it a new perspective [20]. Both identities and skills are those of a collection of people that are distributed. In sum, these theories provide an enriched understanding of the challenges facing amateur video producers, when learning is embedded in a context.

METHOD AND SETTING

Inspired by anthropology, and in line with several ethnographic studies within HCI, we use an ethnographic approach which allows a focus on interpretation of in-situ interviews and field notes [34,36,41,43], complemented with audio recordings, to inquire into how production is performed and learned. The method provides accounts of people’s practices, and their orientations, in environments. Within anthropological ethnography, the main instrument for acquiring data, about what people do as well as their motivations and identities, is the ethnographer per se and the understanding that grows out of spending time with people. The presentation reflects our ambition to discuss a set of situations occurring among several Pro-Am producers. Hence, the need to present several excerpts and three cases. The study draws on three full day observations of volleyball events i.e. two days of observations of football events and two days of observations of dance events. Interviews were made during setup, breaks and after the broadcasts. The collected data consists of audio files, photos, our own video recordings and field notes. All of the interviews were done with key people within the three sport organizations, i.e. people who were mainly involved in producing the broadcast. The interviews were recorded and transcribed. The transcriptions were then read several times by the research team and specific topics of particular interest were chosen. The Pro-Ams were selected because they frequently broadcast different local sport events.



Fig. 1. a-c Pro-Am producers of volleyball match; football match and dance event.

We searched two websites for live video [3,33] to identify repeated broadcasters, who were then contacted. We recruited three individuals that were in charge of the broadcasts, with varying experience in live video production. The football broadcasts are produced a couple of times a month during the season, and they have been active since 2008. The volleyball producer has broadcast

video since the beginning of 2006. Throughout the season, he sometimes broadcasts several times a week. The dance events we studied were broadcast only for the second and third time, but were supervised by persons with extensive experience of the medium.

The studies were made in five different cities in Sweden during the spring of 2011. The volleyball producer is using one main video camera, which he typically mounts high on one of the stands. He also operates this camera for player interviews after the game. A small mixer table is used to combine the video stream, with different audio tracks. A commentator’s microphones, headphones and computers are also part of the equipment. The producer of the soccer tournament has two computer screens, of which one showing the broadcast and the other a screen where they present graphics with updated scores. Most of the technical equipment is placed in the secretariat but they also have a microphone mounted to the fence by the field and a sky lift where the video camera is placed. During the first broadcast occasion the dance producers have one video camera and one large microphone placed on one of the stands. A computer with the broadcasting information is placed in a commentator booth just beside the equipment. At the second broadcast site the producers are situated close to the floor. All their equipment is at a single table, except for the microphones that are positioned by the dance floor.

ANALYSIS

In the following, we analyze the ways in which Pro-Ams’ continuous learning can be understood both from an individual perspective, and from an organizational view. In the first part of the analysis we discuss aspects of learning as individuals; it’s contingent and situated character as well as the intermingling of learning and identity creation. In the second part we discuss how Pro-Am productions are faced with the challenge of developing as an organization, and in many occasions within an existing institution. This challenge includes socially negotiating the character of the broadcast and negotiating learning opportunities.

Individual and situated learning

With reference to the following two excerpts, we discuss how a perspective on individuals’ learning refers to specific situations, rather than universal skills, and that learning blends into identity making.

Attending to situated instructions

The individualistic perspective on Pro-Ams’ learning, as outlined in media studies, is relevant also when accounting for our producers, such as in the following case when beginners are trained by attending to instructions given by experienced producers. Then and there it is a single person that is acquiring skills from another better-trained individual. Instructions are given by a producer who is simultaneously organizing the event and producing the broadcast. The latter involves handling the equipment and

instructing the assigned cameraperson, who could be a parent, a sibling or another community member. In the following excerpt the new cameraperson is a sister to a player, who has volunteered to capture today's game from a sky lift.

Excerpt 1: Instructing others in the community to broadcast

- 01 *Producer* *The sound will not be up there so you can talk and*
02 *chew gum and whatever you want.*
03 *Camera* *That was what I was most worried about*
04 *Producer* *We put the sound [microphone] here.*
05 *Camera* *Yes:::*
06 *Producer* *So just to follow the (inaudible). Follow the game*
07 *and if it gets to a shootout. Patrick shows you*
08 *how you can pull up the sky lift basket so you are*
09 *almost straight above us here. Otherwise you*
10 *have the pole in the middle of the picture. You have*
11 *to bring the lift more outward. Are you afraid*
12 *of heights?*
13 *Camera* *Oh, no.*
14 *Producer* *It's like an amusement park.*
15 *Associate* *It will be fine.*
16 *Producer* *Yes, it's fine.*
17 *I'm happy that you could do this.*

The excerpt demonstrates how the senior organizer instructs the beginner to use visible features in the local setting to get the right camera angle (line 9), which in this case is a pole. The instructions also consider technical features of the sky lift (line 7), something that also has to do with the type of content that will be filmed. The producer is concerned with getting as much as possible of the field in view (line 7) and to move the sky lift "almost straight above us here." The physical environment, that is the pole, is also used to explain what should and should not be included in the picture. Learning from instructions depended on understanding its situated relevance. Lindwall et al [30] describe how such learning develops through instructions-in-interaction, highlighting in this case both the relationship between the instructor and the amateur and how it is "characterized by both parties being reciprocally attentive and finely tuned towards each other and the developing skill."

The excerpt further demonstrates how the instructions account for the specifics in the situation, such as the need for the producer to attend to the heterogeneous interest of the cameraperson and the event management. First, the instructions are easy going and attentive to the beginner's enjoyment, e.g. mentioning chewing gum (line 2) and likening the production to an amusement park (line 14). The producer motivates the photographer by suggesting that she is in an "amusement park", where the sky lift becomes a tool for her to enjoy herself. This is in line with the concept of "recreational orientation" [17] which accounts for the need to provide for amateurs' attention to their own enjoyment, and for other peoples' demands on them, when providing user generated video content as part of their

leisure. This attentiveness to the present cameraperson also includes soothing. Another adult tells the photographer (line 15) that everything "will be fine". This consoling of her probably anticipates the photographer's fear of heights, as expressed in line 12. The producer continues assuring her "yes, it's fine", which points to the necessity to account for the experience of the team members. Furthermore, the producer motivates her by referring to how pleased he is that she is willing to make this effort for the community (line 17), which shows his attempt to form a community. In an interview, he describes this motivation in a way that resembles Benkler's et al. [7] account of ProAms' attention to "social connectedness."

Second, the instructions account for the producer's needs to keep the production manageable and simple, in order to make it fit with other event management that requires his attention. The quick instructions and delegation of the tasks to the team can be seen as doing the two tasks of supporting broadcasts and providing space for event management. The fact that the broadcast producer is focused on the organization of the event as a whole, factors into the instructional situation, and make it a locus for "various forms of dialogical interaction [36]."

In all, the instructions given from an individual to another do not transfer a set of well bounded knowledge. The learning is intertwined with the situated event itself. Instructions also account for heterogeneous needs and motivations of the individual, broader organizational requirements, and the situated setting at hand.

Individual learning by mimicking professionals

The next excerpt reveals how learning is blended into the producers' identity making. The volleyball producer learns through mimicking professionals, but then mixes acquiring skills with the process of acquiring an identity, which is not always the same thing. In the interview excerpt below, he discusses how he learn to improve his skills:

Excerpt 2: Getting inspiration from professional production

- 01 *Producer* *...describes every little flower as a great work of*
02 *art, or whatever you do. Mats Strandberg on*
03 *"Radiosporten" for example, is very good at that.*
04 *He can make a tennis match exciting on the radio.*
05 *And it's like, two players who play back and*
06 *forth. It is so unbelievably exciting just because he*
07 *is so good at commentating.*
08 *Researcher* *Are you trying to get inspiration from television*
09 *sports and radio sports that exist today?*
10 *Producer* *Yes, absolutely. Whatever TV sports you are*
11 *watching you look at it in a different way when you*
12 *are doing it yourself. You can't watch a game*
13 *on TV without observing that 'ok, that's how they*
14 *solved that TV-production'. You create ideas of*
15 *your own and so on.*

To become a skilled cameraperson and commentator he watches TV and listens to radio and then copies what the professionals are doing. In his strategy of learning by doing, he strives to develop an expert's eye and the practical skills that come with that perspective, through "embodied apprenticeship [42]." His domain knowledge is a useful reference, but attaining the actual production skills must be done through practice in a broadcast situation.

At the same time, he is also striving to acquire an identity of a professional broadcaster. This is visible in the outfits he wears such as a suit during the play-offs, and specific clothes in colors matching his own channel logo. His personal car is also marked with the same sign. In this sense, he displays what Wenger calls "ways of being a person" in a certain context [45] i.e. both the way he presents himself and the way he learns. The way this is done makes it difficult to separate his identity creation, thorough the visual expressions on signs and clothes, from his focused attention to professional broadcasts on TV and radio commenting. His aspiration makes visible how learning is intertwined with developing an identity.

Organizational learning

In the following we will turn our attention to how learning ProAm production occurs through institutional development. Changes in broadcasting are conceived as occurring in-between people in particular settings. In particular, we discuss a controversy on sound capturing during a dance competition, and a discussion during a volleyball tournament. These cases display various aspects of the value of an organizational perspective in ProAm production such as pointing to necessary "strategies" in which to alter the institutions that affect the end result. Here we point to event adaptation, or visualization of a "professional" identity.

Negotiating production through event adaptation

We examine a situation where the sound capture needs to be negotiated when a conflict emerges during a dance broadcast. The participants in the discussion are members of the broadcast production crew and the competition's referees. It has come to the former team's attention that the referees want to change the setup of the production system and move some microphones, since the discussions, concerning the dancers' performances, which they considered to be private, were broadcast live. In the following excerpt, the producer (P) and his assistant (PA) discuss what to do with the researcher (R):

Excerpt 3: Discussion on how to please referees

- 01 P: *If they see a mic, we'll have to hope they'll keep quiet.*
02 PA: *Can't we put up a big sign. (laughs)*
04 P: *(inaudible) shows! It's not a hidden microphone.*
05 R: *Did they hear anything? Or did they discover...*
06 PA: *No, they only heard like by coincidence...On Air. I can*
07 *write that (laughs) Should I do that? Should I write*
08 *"On Air?"*

The topic of the controversy is which part of the event that should be broadcast, and especially who should be audible by the online audience. The location of the microphone becomes a visual and concrete manifestation of that discussion. The producers had placed them close to the dance floor, which is also the area where the referees are standing.

The discussion makes visible that a number of people are involved in making decisions that affect the media broadcast. The producers must make their case in a particular way to be allowed to broadcast from the event. The producers pursue a particular strategy i.e. they try to negotiate with the referees and solve the problem by letting the microphone stay and by asking the referees to adapt and "keep quiet" (line 1). The producers turn the controversy into a problem of visualization. If they make the broadcast more visible, e.g. by displaying a sign saying "on air" (line 6), then the referees would accept its presence and adapt by not speaking about delicate matters.

The conflict is further handled in between themselves by joking about the event as if the referees were stupid not to understand what the microphone was doing. The humor itself can also be seen as handling the referees' rejection of what the production crew try to achieve i.e. an interesting broadcast including the sound generated by the dancers. That rejection is then handled by themselves by not being completely serious in their own role as Pro-Ams. Their answer to the critique of the ways they do the broadcast could be seen as them "playing" the role of producers, rather than attempting to fully have that identity.

In sum, this negotiation makes visible the adaptations that are necessary when doing Pro-Am production. If the referees get it their way, the setup of the system needs to be changed, which affects the sound captured since they need to put the microphone somewhere else. Then the Pro-Am production gets a more marginal position within the event. If the producers get it their way, the microphone stays, but the sound, i.e. what is said in front of it, will be altered. Hence, developing the media and learning how to do a production depends on the acceptance it receives. Second, the identities of the producers are not entirely in their own hands but dependent on what other people think of them.

Defending production by evoking professionalism

In the following example we discuss how Pro-Ams' learning is embedded into an organizational context, and specifically how the role of professionalism is evoked.

In the excerpt, the person who is responsible for the broadcast discusses the setup of the system with an event organizer. The producer is a former volleyball player and referee, and manages a one-man production company beside his second job as a bus driver. This producer is always trying to make sure that he has an overview spot, which is usually situated on the top of the stands. In this case, the producer (P) has been given an undesirable broadcast location and raises the issue with the event organizer (EO):

Excerpt 4: Discussing the set up with an event organizer

- 01 EO *Where do you want to be? Do you want to broadcast*
02 *without a lot of disturbing noises then there for you.*
03 P: *Yes. I think that will be difficult if you want to pan with*
04 *the camera and stuff.*
05 EO: *You can't (stand by) the emergency exit. The firemen will*
06 *think it's bad. There you have the web-broadcast from*
07 *Hallands News and the radio and here's your own.*

The producer refers to his inability to move the camera around (line 3-4), whereas the event organizer argues that alternative places are either not permitted (line 5-6) or taken by other media producers (line 6-7). At the suggested location he can be by himself. The discussion makes visible the production as negotiated and dependent on its role in a wider organizational context. There are several people who have influence over the broadcast content e.g. the location of equipment. In the end it depends on broader organization, and the production should be seen as something that should fit into something that is already there as an event before Pro-Am productions.

The following case is similar to the previous excerpt, since it involves a discussion which has consequences for media capture, but it is different since the latter involves an explicit formulation of the identity that is challenged along with the positioning of production equipment. The volleyball producer usually attaches some of his microphones to the referees and team leaders. During the game he can then switch the broadcast sound from his own commentating to the teams' 'technical chat', specifically when there is a break in the game. On this occasion, a team leader refuses to wear a microphone, which seems to make the producer frustrated: He says: "This would never happen if it were [national public service television]".

His comment can be understood in the light of his aspiration to being or becoming a professional (see excerpt 2). Thus, he interprets the conflict as being due to the team leader not recognizing him as a professional.

Pro-Am production is often an endeavor that depends on an organization. The production teams often consist of more than a single person, and the events that are being broadcast are in themselves organized and have existed much longer than the broadcast activity. The broadcaster therefore needs to fit their organization into this social space. This mixing of the new and the old organizational tasks sometimes depends on changes in the latter. The organizer of the event needs to help out i.e. provide space and change their behavior in front of cameras and microphones. Thus, Pro-Ams depend on learning skills and identities among people who would not describe themselves as video producers.

Furthermore, we see that there are negotiations that involve both learning and identity creation, which takes place in a specific situation. First we have pointed out the way that this situation depends on environmental concerns such as

how the system features are located at a specific site. Second, we have pointed at the strategies through which the producers negotiate a broadcast according to their requests. These strategies include either a narrow and visual request for adaptation, or a broader visualization of a "professional" identity. If these claims are not recognized by the broader organization, it will have consequences for learning, identity, and the actual broadcast.

DISCUSSION

The findings have implications for the HCI community, media theory, and for future directions of design of technology for Pro-Am video production.

From contained skills to learning by doing

The ethnographic study revealed how video producers not only bring knowledge into a specific broadcast event, but also learn by doing, e.g. using strategies such as instructions by experienced broadcasters and by mimicking professionals. This perspective draws attention to the challenges involved in understanding specific settings and situations, as well as the relation between the skills and identity of an individual. First, we saw how the organizer of the football event gave instructions to a novice camera person. Importantly the instructions included statements, which *combined practical advice* on how to turn the camera *with motivations* describing the enjoyment in doing so, as well as the value for the rest of the community. The instruction in action was thus designed to combine production advice with motivations. Second, the study also revealed the importance of *mimicking* features of professional broadcasts, such as the way a famous commentator narrates a game. This learning approach was also made visible by both clothing and branding, which were used to form a complementary identity. Thus, in both cases we saw the importance of Pro-Ams' learning in concrete productions, through various strategies, and the way that both skills and identity were linked to each other and co-developed over time. The need to learn by doing production in a situation adds to the challenges previously discussed in HCI e.g. editing [30,26,46], finding and capturing relevant content [23], handling controls [23,30,46] and combining production with other interests [17, 30].

Designing tools for individual learning. In designing production technology, there is a natural focus on guiding the user in the production process, with the aim to achieve a satisfactory end result, i.e. a broadcast or produced video. Based on our findings on the growing class of live video Pro-Am producers, learning and improving skills are key motivations that could be emphasized in design even further. Returning with these findings to HCI, tools and interfaces could be designed to support learning styles, such as mimicking professionals or engaging community members, as well as production skills. The type of learning seen here would be further supported by tools for recording and reflecting upon one's own production process. Using

the current study context as an example, this could involve automatically documenting configurations and process steps, e.g. of setups of cameras and microphones, and recording editing decisions to be revisited afterwards.

From individual development to organizational learning

Our findings expand on current theory's explanations of the Pro-Am phenomenon as consisting primarily of individually held qualities and motivations. In this study we have shown Pro-Am production to sometimes be an organized effort in the sense that it is dependent on *several people*; it is *embedded* into pre-existing organizations; it is *situated in a physical setting* and *socially negotiated*. These general features are true for all broadcast occasions we observed, and would arguably transfer to similar forms of socially situated media production. First, even in the single camera set ups studied here, two of the cases were dependent on several people for their operation. The football production required an instructor, who also did the mixing and broadcasting, as well as a camera operator. The dance broadcast required a producer, an assistant, and an expert advisor. Second, the broadcast production activities must be integrated, or embedded in, the on-going production of the event itself, including its present audience, other media and the rules of the game. Both the Pro-Ams' occasional dependence on several people, and the request to fit with other organized activities, require us to understand production as a collective activity that needs to be negotiated and structured. Third, those activities were *situated* in local environments, with fire escape doors at specific locations and dance floor areas for referees. These contingent characteristics are approached by the members of the organizations, in discussions or negotiations, which involve skills, identities and tactics. For instance, professional identities were at play in acquiring sounds of the referees during the dance contest. In such situations, the characteristics that are negotiated appear then and there, i.e. in the situation. Furthermore, the necessary understanding of the identities of the participants is distributed in the organization and part of what is at stake, for example in a conflict. Compared to media studies, and the views presented there on Pro-Am production, this is a different perspective, which highlights negotiations, collaboration and strategies as important in media production.

Non-disruptive design. Tools for media production in contexts where the production does not have full professional authority should be designed to be as non-disruptive as possible. They should ideally be quick to set up, and not interfere with the covered activity, in competing for space or for the attention of other participants. Tools derived from professional technology (e.g. consumer video cameras, studio equipment and software suites) are typically designed for performance and not with such considerations in mind. Mobile technology, such as camera phones and microphones connected through wireless networks, has the potential of reducing bulky and space

demanding equipment. It also offers mobility outside of fixed activity settings and is less intrusive when capturing media. Another potential lies in designing spaces that are intended for both activities and media capture. Following the model of large sports arenas, where design considerations are made in order to integrate both activities without unnecessary interference, e.g. by integrating some of the infrastructure and tools in the physical space.

These findings are of relevance for established HCI research on media spaces, with its interest in live video and audio communication to provide a sense of "presence" [29,14,11]. Our analysis suggests that we should not only consider the design of the digital systems, but also the design of architecture more broadly. It is not just about broadcasting the activities in the physical context, but also about how the physical context could be designed to support it.

Design for inter-organizational communication: "social tally lights". Professional cameras are equipped with a red tally light, which indicates to a cameraperson that they are "on air". This is an important communication feature in multi-camera broadcasts. The findings in this study reveal complex institutional arrangements, such as negotiations on where to place microphones, which depend on tense discussions between people at the event as well as the making of paper notes. These activities might instead be supported by digital interaction. For example, a mobile device which is similarly placed beside a referee could communicate with surrounding people through its screen. It could then provide extensive information that goes beyond a red tally light. It could present people involved in the negotiations and agreements, and represent the recurrence of the productions. Using screens of mobile devices is perhaps not optimal, but it is a pragmatic solution for a social tally light.

Tools such as live comments and embedded social media functionalities could be further emphasized, and would make up contact points towards communities intended as receivers of the produced content. The fact that one of the studied producers chose to include Facebook on a separate computer in his setup, as an ad-hoc communication channel, highlights the usefulness of social media in the production context. For live media producers, dedicated live chat functionalities could be implemented in the user interface. Location based technology add to the opportunities for connecting to people locally, e.g. by allowing people in the audience to check in and provide comments on the production, in text or face to face.

Recurrent production as a design resource in HCI

Broadcasting recurrent events can function as a strategy for organizational development, as well as for the individual practice of learning by doing. The recurrent nature of these broadcasts follows from the fact that the pre-existing organization is set up to handle a number of recurrent games or events. If the producers, and other people that

matter for creating both broadcast and the event per se, are successful in reaching agreements on what to capture and when to do it, this becomes a resource for future negotiations. Recurrence is thus not only a contingent circumstance, but also an important condition, that enables producers to establish working conditions for themselves over the course of several productions. The coverage of recurrent events is a type of production that points to the future of live video media, as they provide a resource for continuous organizational learning and identity formation.

Both individual and institutional learning would be supported by targeting recurrent events. Such a strategy could also inform the handling of two previously identified challenges in live video production i.e. finding and capturing relevant content [20,26] and knowing when to start and stop [20,26,39]. The performative nature of events provides exactly such features; action that makes an effort to stand out from the ordinary, as well as easily identifiable start and end points. This points to the necessity of designing for increased opportunities for aspiring video producers to collaborate with organizers of recurrent events.

Extending media studies

Ethnography in HCI has historically been used to inform design, and has had a specific inclination towards unpacking the details on on-going everyday interaction. That sort of knowledge interest also has a wider importance. In media theory there has been an extensive discussion on the characteristics of Pro-Am production. The focus has been on the identification of individual skill sets and motivations that would explain the emergence of this type of video media. Accordingly, they have been seen as persons holding qualities and personality traits of different kinds, and their skills' evolution over time is dealt with only implicitly, in terms of e.g. the motivation to excel in a particular craft, alongside other motivations. This focus was adequate for describing the broader Pro-Am phenomenon as it emerged. Our ethnographic study adds to media theory's descriptions by providing an understanding of the development of skills as it occurs over time in real production contexts. We shift the empirical focus to the social practices that precede and generate Pro-Am broadcasts, and add to the theoretical understanding of how they are enabled. Through this empirical focus we also make it possible to inform media studies of recent research in learning studies. The findings add the significance of organizational learning and negotiation between co-located activities to previous descriptions.

Similarly, the Long Tail concept addressed broad tendencies in society, and when it was extended to TV, it only scantily anticipated the developments we now see happening in amateur and Pro-Am production, beside broader trends of mass availability of content for consumption. Revisiting long tail TV means, an increased attention to aspects of that concept that have been the least recognized. We already see mass availability of TV content

in downloads and on-demand TV, but the expected mass production of new TV content through the democratization of professional means of production is only an emerging promise. We point to the complexities involved in extending the production "tail". It appears that on the production side, growing the Long Tail involves more than developing inexpensive technology for production and distribution. Creating trust, developing knowledge and involving local organizations are also of great importance, as Long Tail TV leaves the traditional broadcast model of one-to-many for a community based model.

CONCLUSION

We report on Pro-Am live video production, and contribute through detailed analysis of how skills and identities are developed in practice. It has been conceived as a promising next genre of media to be conquered by amateurs using broadly available technology and working to professional standards. At the same time it has been pointed out that users find live broadcasting difficult to master, and they may need to acquire skills over time. We focused on the conditions for such production of reoccurring broadcasts. In contrast to existing accounts of Pro-Ams, as people holding individual qualities and motivations, we describe how both individuals and the organizations around them develop through on-going and recurrent production activities. Skills and identities are important in this practice but need to be understood in their local context. It is also evident that in order to produce regularly, it is large groups of users or organizations, rather than individuals, that develop new ways of working and relating to each other. When that social context is made visible, a range of challenges stand out, such as negotiating the production's role and setup within a broader organizational setting.

ACKNOWLEDGEMENTS

The research is made possible by VINNOVA and the Mobile Life Center, in partnership with Ericsson, Microsoft, Nokia, and IKEA, and by EU Fascinate IP.

REFERENCES

1. Al-Ani, B., Mark, G., Chung, J. et al, The Egyptian blogosphere: a counter-narrative of the revolution. In Proc. CSCW '12. ACM, NY, USA, 17-26.
2. Altheide, A. L.: Identity and the Definition of the Situation In a Mass-Mediated Context. In Symbolic Interaction, Vol. 23, No. 1, p. 1-27 (2000)
3. Anderson, C. (2005) Long Tail TV. Article in five parts on Wired.com, January 10-17 2005. Last viewed 2013-09-16
4. Anderson, C. (2006) The Long Tail: How endless choice is creating unlimited demand. Random House Business Books, London
5. Bambuser <http://bambuser.com/> (accessed 2013-01-20)
6. Benkler, Y.: The wealth of networks: How social production transforms markets and freedom. Yale University Press, New Haven (2006).

7. Benkler, Y., Nissenbaum, H.: Commons-based peer production and virtue. *Journal of Political Philosophy* p. 394-419 (2006)
8. Bentley, F.R., Groble, M. TuVista: Meeting the multimedia needs of mobile sports fans. *Proc. ACM MM'09* (Beijing, China, October 19-24), 471-480.(2009)
9. Boreham, N., and Morgan, C.: A sociocultural analysis of organizational learning. In *Oxford Review of Education*, Vol. 30, No. 3 (2004)
10. Bergstrand, F., Landgren, J. (2011) Visual reporting in time-critical work: Exploring video use in emergency response. *Proc. MobileHCI 2011*, 415-424.
11. Bly, Harrison, Irwin, Media spaces: Bringing People together in a Video, Audio and Computing Environment, *Communications of the ACM*, Jan 1993, Vol 36 No 1.
12. Burgess, J., Green, J.: The entrepreneurial Vlogger: Participatory culture beyond the professional-amateur divide. In Snickars, P., Vonderau, P. *The Youtube Reader*. National Library of Sweden, Stockholm 89-107 (2009)
13. De Sá, M., Shamma, D.A., Churchill, E., Live Mobile Collaboration for Video Production Design, Guidelines, and Requirements. In *J. of Personal Ubiquitous Computing* (forthcoming)
14. Dey A. and Guzman de, E. From awareness to connectedness: The design and deployment of presence Displays, In *proc. CHI 2006 Montreal, Canada*, p 899 – 908
15. Dougherty, A.: Live-streaming mobile video: Production as civic engagement. *Proc. MobileHCI 2011*, 425-434 (2011)
16. Engeström, Y.: Learning by expanding: an activity-theoretical approach to developmental research. *Orienta-konsultit, Helsinki* (1987)
17. Engström, A., Perry, M., and Juhlin, O.: Amateur Vision and Recreational Orientation: Creating Live Video Together. In *Proc. of the SIGCHI conference on Human factors in computing systems (CHI '12)*. ACM, New York, NY, USA (2012)
18. Erikson, E. H.: *Identity: Youth and Crisis*. New York: Norton (1968)
19. Gillmor, D. (2010), *Mediactive*. Published under a Creative Commons Attribution-NonCommercial-ShareAlike license.
20. Hutchins, E.: *Cognition in the Wild*. Bradford: MIT Press (1995)
21. Hrastinski, S.: *Participating in Synchronous Online Education*. PhD. Diss. Dept. of Informatics, Lund University (2007)
22. Juhlin, O., Zoric, G., Engström, A., Reponen, E. (2013) Video interaction: a research agenda. *J Personal and Ubiquitous Computing*, Springer London, p 1-8
23. Juhlin, O., Engström, A., and Reponen, E.: Mobile Broadcasting - The Whats and Hows of Live Video as a Social Medium. In *Proc. MobileHCI 2010*, 35-43 (2010)
24. Keen, A.: *Cult of the amateur: how today's Internet is killing our culture*. Doubleday, New York (2007)
25. Kennedy L. and Naaman M. 2009. Less talk, more rock: automated organization of community-contributed collections of concert videos. In *Proc. WWW '09*. ACM, NY, 311-320.
26. Kirk, D., Sellen, A., Harper, R. & Wood, K. 2007. Understanding Videowork. In *proc. CHI'07*, San Jose, USA
27. Lampe, C., Wash, R., Velasquez, A., Ozkaya, E.: Motivations to participate in online communities. In *Proc CHI '10*. ACM, NY, USA, 1927-1936 (2010)
28. Leadbeater, C., Miller, P.: *The pro-am revolution: How enthusiasts are changing our economy and society*. Demos, London (2004)
29. Lee, Nass C., *Designing social presence of social actors in human computer interaction*, CHI 2003, Ft Lauderdale Florida USA p 289-296
30. Lehmuskallio, A., Sarvas, R. Snapshot video: everyday photographers taking short video-clips. In *Proc. NordiCHI '08*. ACM, NY, USA, 257-265.
31. Lindwall, O., and Ekström, A.: *Instruction-in-Interaction: The Teaching and Learning of a Manual Skill*. In Springer Science+Business Media B.V. (2012)
32. Murphy, P., and Hall, K.: *Learning and Practice: Agency and Identities*. Sage Publication Inc., London (2008)
33. Qrodo <http://qrodo.com/> (accessed 2013-01-20)
34. Rangaswamy, and Cutrell (2012). *Anthropology, Development and ICTs: Slums, Youth and the Mobile Internet in Urban India*. ICTD'12, ACM, NY, USA, 85-93
35. Reponen, E., Lehtikoinen J., and Impiö J.. 2007. Mobile phone video camera in social context. In *Proc. CHI'07* J. A. Jacko (Ed.). Springer-Verlag, Berlin, Heidelberg, 460-469
36. Räsänen and Nyce 2006. A new role for anthropology?: rewriting "context" and "analysis" in HCI research. *NordiCHI '06*, pp 175-184
37. Shirky, C.: *Here comes everybody: the power of organizing without organizations*. Penguin Books, New York (2008)
38. Stables, A.: Learning, identity and classroom dialogue. In *Journal of Educational Enquiry*, Vol. 4, No. 1 (2003)
39. Sutherland, L., Howard, S., et al: Professional identity creation: Examining the development of beginning preservice teachers' understanding of their work as teachers. In *Teaching and Teacher Education* 26 (2010), 455-465 (2009)
40. Van House N.A. 2007. Flickr and public image-sharing: distant closeness and photo exhibition. In *Proc. CHI EA '07*. ACM, NY, USA, 2717-2722.
41. Wang, T., and Brown, B.: *Ethnography of the telephone: changing uses of communication technology in village life*. In *Proc. MobileHCI* (2011)
42. Weddle, A. B., and Hollan, J. D.: Professional Perception and Expert Action: Scaffolding Embodied Practices in Professional Education. In *Mind, Culture, and Activity*, 17, p. 119-148 (2010)
43. Weilenmann, A., and Juhlin, O.: Understanding People and Animals: The Use of a Positioning System in Ordinary Human-Canine Interaction. In *Proc. CHI '11*. ACM, New York, NY, USA (2011)
44. Weilenmann, A., Säljö, R., Engström, A. (forthcoming) Mobile video literacy: negotiating the use of a new visual technology
45. Wenger, E.: *Communities of Practice: Learning, Meaning, and Identity*. Cambridge University Press, Cambridge (1998)
46. Vihavainen, S., Mate S., et al. 2012. Video as memorabilia: user needs for collaborative automatic mobile video production. In *Proc. CHI '12*. ACM, New York, NY, USA, 651-654.