Blended learning for developing effective virtual teams: a proposed intervention format

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Abstract

The aim of this exploratory study was to develop a blended learning approach to fostering the skills and competencies required by leaders and members of international virtual teams. Three levels of analysis were brought to bear in designing the proposed intervention format: first, the factors likely to influence the effectiveness of a virtual team; second, the needs and challenges related to the early stages of the virtual team membership; third, the role of the human resource function in promoting – via training and development programmes – the knowledge and skills needed for virtual teams to be successful. The research questions included: What are the perceived benefits and challenges associated with the early stages of virtual collaboration? What factors must be carefully defined and managed when running a virtual team? What training needs are perceived by inexperienced virtual team members? How can training and development initiatives contribute to the effectiveness of virtual teams? A qualitative approach based on the model developed by Bal & Gundry was used to analyse data from five interviews with virtual team members at Nielsen TAM Italy. The outcomes informed the proposed blended training programme.

1. Introduction

New developments in Information and Communication Technology have brought the collaborative and social nature of work to the fore, making organizations increasingly more likely to adopt virtual teams. Within information-oriented and geographically distributed organizations in particular, virtual teams foster collaboration, learning and the execution of complex tasks in groups of co-workers required to coordinate their efforts over long distances. More generally, a marked shift from physical to virtual workplaces is now underway (see [2]). In light of these changes, academic research has increasingly focused on the factors believed to play a role in the successfulness of virtual teams. For example, aspects such as trust, organizational culture,

human resource policies and practices, job tasks, virtual team design and the characteristics of the technological platforms used to support virtual teams have been examined with a view to identifying the social processes enabled by virtual teamwork and the strategies required to maximise its effectiveness [3-5]. Another crucial variable affecting the outcomes of virtual teams is leadership style, which contributes both to team performance and to the learning and development of team members [6-10].

Despite growing research interest in virtual teams and the factors underpinning their success, few studies have investigated the training and development (T&D) initiatives needed to create effective and successful virtual teams. Nor has much attention has been paid to how the human resource function can promote acquisition of the specific set of

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knowledge and skills required by high-performance virtual teamers [2, 6].

In seeking to fill these gaps in the current literature, we set out to analyse the functioning of virtual teams at three different levels. First, the factors likely to influence the effectiveness of a virtual team; second, the needs and challenges related to the early stages of virtual team membership; third, the role of the human resource function in promoting – via T&D initiatives – the knowledge and skills needed for virtual teams to be effective and successful. The first step in our exploratory investigation was focused on identifying the specific training needs of newly formed virtual teams. Next, we examined the roles and relative contributions of formal versus informal learning in developing the skills and competencies that new leaders and members require to function successfully as part of an international virtual team. Third, we analysed the need to take organizational factors into consideration when developing T&D initiatives, in terms of both the constraints and the opportunities that may be salient to designing and implementing learning programmes for virtual teams. Finally, we developed a blended learning format designed to take all of these aspects into account and address them organically. Such an approach attributes a key role to the HR function in supporting virtual teams, with a specific focus on how HR can best contribute to the training and development of virtual teamers.

The specific research questions addressed in our study are: What are the perceived benefits and challenges related to the early stages of virtual collaboration? What factors must be carefully defined and monitored when managing a virtual team? What training needs are perceived by inexperienced virtual team members? How can T&D initiatives enhance the effectiveness of virtual teams?

With these questions in mind, we conducted an initial exploratory investigation that was qualitative in nature and involved interviewing five employees at Nielsen TAM Italy who had recently been assigned to global virtual teams. Having identified the main issues and challenges met by individuals joining international virtual teams, we next plan to use a quasi-experimental longitudinal design to further analyse the effects of informal and formal training on virtual team performance. This new phase of our programme will bring an intervention research approach to bear by implementing and testing our proposed blended training programme.

2. Theoretical Framework

Many alternative definitions of virtual teamwork have been proposed in the scientific literature. However, most authors converge in describing the virtual team as a group of people that use computer-mediated technologies to work interdependently across space, time and organizational boundaries [11, 12]. Although the use of technology is typical of virtual teams, which engage in technology-supported working across a vast range of activities and contexts [13], technology alone does not make a team virtual. To be classified as such, a virtual team must display the following six attributes [14]: a) definable team membership; b) interdependence among team members; c) joint responsibility for outcomes on the part of team members; d) relationships among team members across (and sometimes within) organizational boundaries; e) geographical dispersion of team members; f) predominance of computer-mediated over face-to-face communication. The first four of these attributes are common to all types of team; the last two are characteristic of virtual teams. A more concise, yet complete, definition has been suggested by Towsend, DeMarie and Hendrickson, who stated that virtual teams are "groups of geographically and/or organizationally dispersed co-workers that are assembled using a combination of telecommunications and information technologies to accomplish an organizational task" [15:18].

The literature documents a wide range of benefits to organizations that successfully implement virtual team specifically working. Broadly speaking, advantages include enhanced productivity, communications, pooling of interorganizational resources and innovation [16]. More specifically, effective virtual teams can improve an organization's capacity to respond quickly to competition [1], 9], decrease time-to-market [18], boost client satisfaction [19] and raise productivity levels [20, 21]. They can "follow the sun" by implementing 24-hour work schedules [22], facilitate the documentation and assessment of team performance [23, 24] and, clearly, save much of the time and expense associated with relocation and travel. Effective virtual teaming offers benefits for internal organizational environment and culture too. Virtual teams can enhance outcomes in terms of quality, productivity and satisfaction [25, 26], improve communication and coordination, encourage the reciprocal sharing of interorganizational resources and competencies [6, 27-29, 11] and promote a sense of responsibility [30, 31]. Finally, virtual teams can also foster innovation processes by connecting experts in specialized fields working at geographically distant locations [27], favouring the creation of centres of excellence in which talented team members can coordinate their efforts independently of where they are physically located [17, 29, 32-38] and boosting and channelling creativity [35, 39, 40].

However, organizations should also be aware of, and ready to counteract, the disadvantages associated with virtual teams. For example, the lack of physical interaction can hinder the transmission of conceptual understanding when the team is required to carry out complex tasks [33, 41, 42, 43], while the distance factor generates specific project management challenges [35, 44, 45]. Other drawbacks include difficulty in managing conflict [26, 44, 46, 47, 48], mistrust, communication breakdowns and power struggles [27], [33], [49].

The potential weaknesses of virtual teams are best addressed by focusing on the conditions required to overcome the particular challenges of online collaboration and optimize the effectiveness of virtual teams, as well as on the specific training requirements of virtual team members and leaders. A broad array of factors impinge on the effectiveness and success of virtual teams. These include trust [3, 4, 5], [50, 51]; incentives policies and performance appraisal systems [52]; conflict management [5], [50], [53]; team empowerment/decision making strategies [50], [52]; task design and definition of roles, responsibilities, team goals and success criteria [5], [50]; socioemotional cues and cultural differences [5], [50], [52, 53]. In relation to the training and motivational needs of virtual team members [54], the most critical areas identified include project management skills, appropriate use of technology, networking, self-management abilities, as well as cultural and interpersonal awareness [55]. In addition, numerous studies document the key role of leadership in ensuring the success and effectiveness of virtual teams [6, 7], [9, 10], [47].

One comprehensive model of the conditions required for effective virtual teaming is that developed by Bal and Gundry [1], [52]. These authors proposed that the factors implicated in effective team working fall under three main headings: People, Processes and Technology (Fig.1).
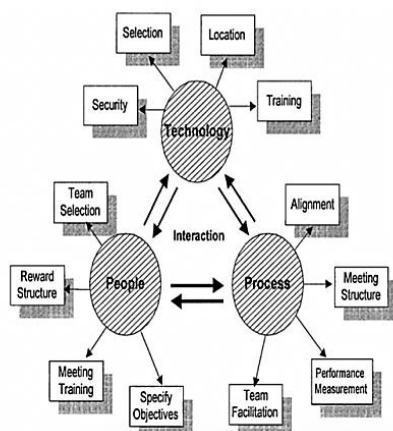
Figure 1. Factors contributing to effective team working [1]

As observed by Bal and Foster [52], this model includes factors that have been overlooked by other theories and frameworks. In other words, its key strength is that it draws together in one holistic view all the variables previously identified in the literature as affecting virtual teamwork. For this reason, we based our qualitative interview protocols on the three main areas in the Bal & Gundry model. In terms of people factors, we explored dimensions such as virtual team objectives (motivation), meeting behaviour (trust), reward structure (motivation and goal setting) and team

selection (support, culture). Under the heading of technology factors, we examined system selection (appropriate technology), security (team effectiveness), location (open plan offices or separate virtual team rooms) and training (skills and competence). With regard to process factors, we asked for feedback concerning process alignment (integration), meeting structure (order), performance measurement (feedback, encouragement, direction) and team facilitation (resource allocation, support).

The adoption of Bal & Gundry's model enabled us to identify the key factors affecting virtual teaming as perceived by inexperienced team leaders and members. In turn, this helped us to pinpoint the associated perceived training and development needs of our informants. Based on these outcomes, we have developed a blended learning format for testing at the intervention stage of our overall research programme.

3. Methodology

The preliminary phase of the research was carried out with Nielsen Television Audience Measurement (TAM) Italy. Nielsen is an American global information and measurement company. TAM is Nielsen's media research branch, whose mission is to deliver in-depth quantitative and qualitative data about television audiences. The unique circumstances of Nielsen TAM Italy make it a particularly valuable context for analysing the workings of virtual teams. First, its Italian employees have only recently been invited to join virtual teams as part of a broader integration process between Nielsen and its new joint venture partner, the European AGB Group. The ongoing reorganization of the group is driving the need for global virtual teams of specialists with the capacity to achieve complex tasks, such as identifying new solutions to business problems or spearheading new product development. This provided the ideal conditions for analysing training needs at the early stages of virtual team membership. Furthermore, the Italian staff entering virtual teams for the first time had not benefited from prior training in collaborative behaviour or project management skills. Therefore, our analysis was not contaminated by previous exposure to training in virtual collaboration on the part of our informants. Third, despite the fact that the Italian virtual team members interviewed were novices to collaborating online, globally Nielsen has a well-established tradition of virtual teaming. Thus, Italian staff joining global teams have immediately been exposed to the approaches of more experienced colleagues and stimulated to rapidly develop their virtual teaming skills. Finally, although this initial phase of our research was confined to the Italian context, other Nielsen subsidiaries in the world display the same characteristics (integration phase, newly appointed virtual team members, no earlier training in virtual teamwork); therefore, future phases may be designed to include other local units with a similar profile.

Given the exploratory nature of the first research phase, we chose a semi-structured interview format to collect data

from five virtual team members based at Nielsen TAM Italy. The interviews opened with a brief description of the research project and a set of questions eliciting background information about the organizational setting. The remainder of the interview protocol was based on Bal and Gundry's model [1], and was designed to explore the three macro-dimensions of people, processes and technology – and how each of these areas can affect the efficacy of virtual teams. Finally, we asked interviewees what training they felt they needed to successfully participate in virtual teams, the potential benefits of virtual collaboration, and existing or planned HRM practices designed to promote the development of virtual teaming skills. The interviews were audio-recorded and transcribed, and lasted an average of one hour.

With a view to identifying the success factors and training needs associated with virtual team membership, the interview data was subjected to thematic analysis, following the method advocated by Strauss and Corbin [56]. Via multiple iterations of coding and discussion, we identified and grouped preliminary concepts (open coding); made connections between the emergent themes and grouped them into higher-order conceptual categories (axial coding); and selected and discussed core categories emerging from the analysis [56, 57]. The results are presented in the next section.

Based on the training needs that emerged from the exploratory phase, we developed an intervention proposal to be implemented in the next phase of the research project. More specifically, at the forthcoming intervention stage, we plan to pilot the blended learning programme presented below and assess outcomes using a quasi-experimental design [83]. Thus, the proposed training programme will be delivered to one sample of virtual team members, while a another sample of employees with characteristics similar to those in the intervention group but not receiving any specific training will form the comparison group.

4. Results and discussion

4.1 Perceived key factors in the efficacy of virtual teams

We now present the interview data, organized under the headings provided by Bal and Gundry's model [1] (table 1).

*** TABLE 1 ABOUT HERE ***

Process issues. Within this area, Bal and Gundry's model identifies four different aspects: alignment, meeting structure, performance measurement and team facilitation. Our informants referred most frequently to team facilitation and alignment; they were less concerned about meeting structure (although it still received a significant number of mentions) and rarely alluded to performance issues.

Concerning team facilitation in particular, the input of the team leader (often referred to as the project manager) was perceived to be the most decisive factor. This appeared to be related the interviewees' perceptions of the difficulties involved in working without face-to-face communication. The team leader should have the skills required to manage the team, provide guidance to individual team members as necessary, drive decision making, and generate and maintain commitment. Team facilitation is especially critical when something goes wrong. Our informants spoke in depth about the multiple ways in which the leader can contribute to the effectiveness and success of the virtual team. For example, the leadership offered should be tailored to meet the current needs of the team at each stage of its development: thus, goal setting (covering both technical and organizational requirements) was seen as the priority focus for the leader at the early stages of virtual team adoption. Once the work of the team has got underway, the leader must provide ongoing social and psychological support as appropriate, as well as delegating technical tasks to team members and leveraging on their gains in knowledge and self-confidence. At the final stages of the virtual team life cycle, the leader must once again change focus: his/her priorities now include managing the wrap-up, and maximising visibility of the team's efforts, achievements and learning outcomes, at both the individual and collective levels. Interestingly, our participants' perspective on leadership had much in common with Hersey and Blanchard's situation leadership theory [58]. In addition, interviewees emphasized the role of leader in building trust, solidarity, defining shared objectives and tasks, identifying mutual interests, and boosting internal legitimacy. That is to say, a virtual team leader is not only required to invest in technical and social skills and competencies, but also to be aware that members' needs will evolve in line with changes in the team itself and that the leadership role must be adapted accordingly. In conclusion, the interviewees perceived the leader's role in facilitating team activities and dynamics (both technical and social) as the main factor influencing the efficacy of virtual teams.

Participants displayed a similarly complex perspective on alignment issues, proving that they had already developed considerable awareness of the functioning of virtual teams. Specifically, interviewees mainly agreed that the team's needs for alignment and communication tools may vary over time as members become more competent and task complexity increases or decreases. Overall, most informants highlighted the importance of creating forms, feedback processes, repositories, and cloud solutions designed to ensure contact among team members and give all parties access to updated progress information. The opportunity to monitor other team members' actions facilitates integration, and is critically to maintaining an overview of the entire process, to problem solving, and to building and reinforcing trust and the social contract. This applies not only to the formal team leader, but to all team members. If alignment needs are catered for, this can compensate for the fact that team members rarely have the opportunity to coordinate their work via face-to-face meetings.

With regard to scheduling meetings, the interviewees believed that it is important to fix periodic meetings, as a means of helping the team to pace its work and to maintain a

high level of commitment over time. They also stated that meetings should follow an established format so that all members are clear on how best to prepare for the meeting and how it will be conducted and followed up. Surprisingly, our informants made almost no reference to performance measurement issues. It appeared that the only performance criteria taken for granted by interviewees was the overall success/failure of the project. This may be due to the fact that none of them had acted as team leader during their first virtual team experience and the projects they were involved in had not yet reached completion.

People issues. Within this area, Bal and Gundry's model contemplates a further four aspects: team selection, reward structure, meeting training and specifying objectives. Our interviewees emphasized all four of these aspects, in general attributing key importance to people issues in the managing of virtual teams. In particular, team selection emerged as a critical factor to be taken into account when forming and managing a virtual team. More specifically, participants observed that it is important to identify the most efficient size of team for the task in hand, given that there is a trade-off between the need for resources (a large number of members may mean a greater abundance of skills, knowledge, experience, perspectives, etc.) and the need for neatness (too many team members may increase complexity and hinder processes such as decision making, coordination, communication and orienting the work of the team). A related issue is the critical need to identify criteria on which to base team selection: while holding skills and competencies related to the task assigned to the team is clearly one of the most important requirements for a team member, the interviewees also named other factors that they believed to be important: the most frequently mentioned were training, culture, language, time orientation and expertise. The most ideal combination of selection criteria – that ensuring maximum effectiveness – depends on the task assigned to the team and so must be defined on a case-by-case basis. Participants also identified reward structure as critical to the functioning of the virtual team. Interestingly however, the reward choices they named as vital to the commitment and motivation of virtual team members were for the most part not financial: approval from team leader and fellow team members, as well as enhanced reputation, endorsement and acknowledgment were singled out, at least at this stage of our informants' experience, as key practices for virtual teams. It should be noted that all informants shared this vision of reward structures. Specifying objectives was the third most important "people" aspect and was raised by almost all of the interviewees. More specifically, they discussed the specification of both personal objectives (in terms of clear and transparent goal setting, and defining of roles and responsibilities) and team objectives (which usually issue from an initial discussion phase involving all team members). The last people aspect referred to was meeting training. Quite surprisingly, only two interviewees out of five cited this as a priority, suggesting that the organization needs to draw on appropriate skills, knowledge and systems to facilitate effective meetings hosted by ICT platforms. The fact that this aspect was not mentioned by the majority of participants suggests that meeting training is perceived as less critical than other issues.

Technology issues. Overall, the interviewees placed far less emphasis on technology-related aspects than on issues of people or process. Within this area, of the four aspects included in the Bal and Gundry model, very few concerns were raised about security and selection and none at all in relation to location and training. With regard to security issues, participants mainly stressed the need to protect the data shared among team members by storing it in a dedicated secure area. This factor was likely salient to these particular informants given the confidential nature of the data produced and elaborated by Nielsen. In general, it should be pointed out that virtual teams mostly apply technologies that are already in use within the organization: this is why the interviewees did not discuss specific challenges related to security, selection or adoption. Taken all around, the feedback obtained from our informants suggests that successful virtual teaming is more about processes and people than about technology.

4.2 Perceived training requirements for effective virtual teams

4.2.1 Project management, leadership, cross-cultural and language issues: the role of formal learning

Interviewees were next asked to state – based on their experience to date – the kind of training and development input that they deemed most critical to helping them successfully perform as members of virtual teams. Overall, they viewed developing a specific set of skills and competencies as an essential requirement for participating in a virtual team. To this end, they believed that organizations should develop training programmes offering a strong background in the specific knowledge and best practices required for virtual teaming. More specifically, they identified four particular areas of knowledge and skills to be developed on a priority basis (table 2).

*** TABLE 2 ABOUT HERE ***

The first area cited – namely, developing English language skills – is not specific to virtual teams per se. This training need is connected with the history of the unit, which has only recently begun to operate within a multinational environment. Nevertheless, virtual teams clearly accentuate the need for language skills training given their global composition.

Training in cross-cultural knowledge and skills was the second crucial area of development pinpointed by interviewees in light of their initial virtual team experience. They had become aware that to function effectively and contribute successfully within their virtual teams, it was

essential to be familiar with the cultural behaviours, social rules and habits of the other members. Clearly, this need is amplified by the lack of physical interaction and face-to-face communication.

The third area of development mentioned by our informants was project management. The interviewees emphasized the need to acquire the specific project management competencies and skills required to function effectively and successfully as a virtual team leader or member, suggesting that traditional competencies and skills are inadequate for virtual teaming, given the different set up and rules that characterise virtual environments.

Leadership was the final key area for development flagged by the participants, who appeared to view the role of virtual team leader as extremely challenging. Thus, the possibility that the organization might ask them to lead a virtual team in the future was described as a source of concern. Interestingly, when discussing this point, the interviewees raised the same key people and process factors reported in paragraph 4.1. This shows that their initial experience had made them fully aware of the complexity involved in running virtual teams.

4.2.2 Cross-cultural and social leadership issues: the role of informal learning

Overall, interviewees attributed a key role to the informal learning they had experienced as members of a virtual team. They reported that participating in a virtual team had allowed them to develop a range of skills and knowledge, not only in the technical domain, but also in the areas of conflict management, motivation, decision-making and leadership. In short, hands-on experience of virtual teams can enhance personal professionalism in multiple areas, and such learning and development may be reinforced by appropriate formal training, as outlined above.
In relation to informal learning, among the most interesting and unexpected results of this exploratory phase in our research, was participants' analysis of their personal learning and benefits, which they mainly identified as affecting two particular areas.

First, interviewees reported changes in their global identity and cultural intelligence. Global identity is defined as a sense of belonging to a global multicultural team [59, 60]. Specifically, our informants reported experiencing a greater sense of inclusion, as well as a reduced sense of national identity combined with a stronger perception of being part of a culturally diverse group. More generally, they claimed to have developed a more holistic view of organizational functioning, in keeping with research showing that multicultural work experience fosters the development of a global identity [61]. This is a key plus for the organization, because global identity is positively associated with successful multicultural teaming [61], positive emotions [62], and effective global leadership [61]. Furthermore, all participants perceived themselves as having become more competent and professional at operating in multicultural contexts. This outcome of virtual teaming

experience may be explained in terms of enhanced cultural intelligence, that is to say, the specific form of intelligence that enables an individual to function effectively in situations of cultural diversity, such as the virtual team environment [63, 64].

Second, another unexpected consequence of engaging in virtual teaming was the emergence of a social dimension of leadership. More specifically, the interviewees reported three main factors that can shape leadership dynamics in virtual groups: 1) team members often emerge as leaders when they hold the skills, knowledge, or expertise required by the team; 2) members can access information that in traditional teams is only available to the leader; 3) the leader's influence is challenged by the fact that followers know more about and have more opportunities to contribute to the decision-making process than in traditional teams [65]. These features are in line with an emergentist view of leadership, which frames leadership function as an outcome of group dynamics [66] and interprets it as shared among team members [67]. In brief, leadership "entails a simultaneous, ongoing, mutual influence process within a team that is characterized by the "serial emergence" of official as well as unofficial leaders" [68]. It may therefore be viewed as both an individual trait and an organizational trait [69]. Taken all round, these findings suggest that the leadership of virtual teams might usefully be explored in light of the constructs of e-leadership, shared leadership and social leadership recently proposed in the literature [74]. Specifically, e-leadership concerns how technology can mediate social influence to modify attitudes, feelings, thinking, behaviours, and/or performance on the part of individuals, groups and/or organizations [70]. On the other hand, shared leadership is defined as "a dynamic, interactive influence process among individuals in groups for which the objective is to lead one another to the achievement of group or organizational goals or both" [71:1]. In line with both the e-leadership concept and shared leadership concept, we ourselves have developed the construct of social leadership, defined as "a social process of mutual influence among the members of a group/organization who, by interacting through social media, share the responsibility of leadership in order to achieve group/organizational goals" [72:3].

4.3 A blended training format: developing effective virtual teams

The findings discussed in the previous section clearly suggest that learning how to function effectively as a member of a virtual team requires both formal learning (involving the acquisition of declarative knowledge) and informal learning (based on direct experience of virtual teaming). This type of blended approach to learning is well known, especially in the organizational context, in which adult learning requirements demand that: a) the majority of learning programmes be embedded in practice, b) training programs match operations [75, 76] and, c) a continuous learning perspective be promoted and developed [77]. Within such a framework, the role of formal learning is to

enable (activate) the early stages of experience, and provide a framework for the rationalization of experiential learning.

In this section, we set out to define the role of T&D in enabling effective virtual teams and to suggest a comprehensive learning approach to developing the knowledge and skills required for virtual collaboration. To this end, we present and discuss a blended learning training program aimed at fostering the knowledge, skills and capabilities that our analysis has identified as crucial to successful participation in international virtual teams: project management, social leadership and cross-cultural skills (see table 2). This proposed blended learning format does not address the need for English language skills reported by our informants, which we view as a general requirement in contemporary work environments, and which cannot be meaningfully improved in a short length of time in any case.

Specifically, assuming an organizational scenario similar to that identified at Nielsen TAM Italy (whereby Italian staff members were being involved for the first time in international virtual teams), we suggest a blended learning approach structured as follows (fig. 2).
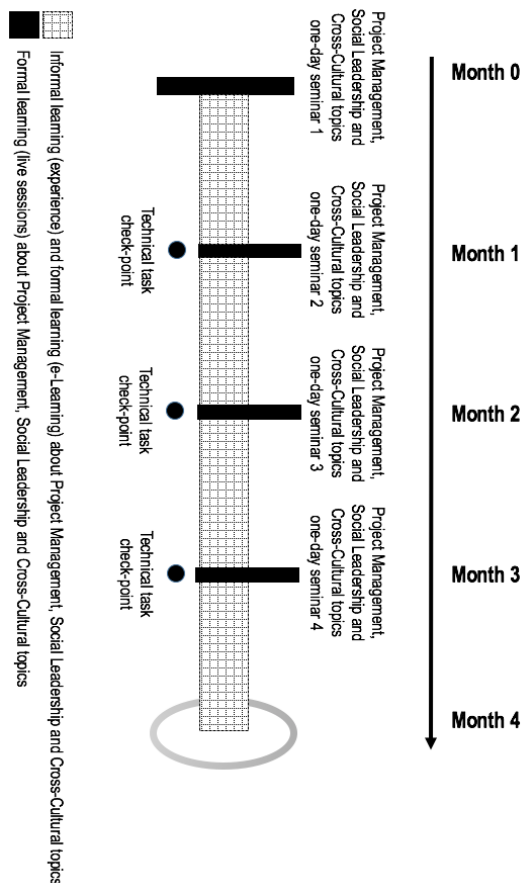
Figure 2. A Blended Learning Approach for effective virtual teams

First, international virtual teams of about 6/8 members should be formed. Each virtual team should include two or three inexperienced members. In addition, it will be necessary to assign a specific and clearly defined task to each of the virtual team created. This task should be related to real organizational needs and have measurable final outcomes. Under no circumstances should teams be given a simulated or hypothetical assignment. The virtual team members must experience real pressure to perform, based on their perception of the task as significant, set by an internal client, and contributing deliverables on a par with most other organizational assignments. Giving the virtual teams responsibility for real organizational tasks will not only generate the necessary energy, motivation and perception of reality: the nature of the task itself will suggest who the virtual team members should be. It will be vital to take due care with the composition of the virtual teams: as for any real team (virtual or otherwise) charged with a real task and committed to an internal client, the technical skills, competencies and roles required by the task must be in place.

In short, by establishing virtual teams with responsibility for real organizational tasks, we will create the optimum learning environment for acquiring the knowledge and competence required to work effectively on a virtual team. Another key aspect of preparing this environment will be assigning the virtual teams with tasks of an appropriate level of difficulty: neither too simple nor too challenging. In defining the right kind of task, at least two factors should be borne in mind. First, leaders and members will be required to engage in a new virtual way of working (which is the object of learning): they will not be able to focus all their attention on the technical aspects of the task. Second, the task should be complex enough to require the team to work together for a meaningful length of time. We suggest that to enable lasting learning, a first virtual team experience should ideally last around three months.

A team of trainers will support the members of each virtual team throughout the entire life cycle, providing different kinds of input as the process unfolds. They will contribute to the overall experience not only by delivering the knowledge, guidelines, and analytical tools methods required for successful virtual teaming (technical and formal training), but also by periodically offering opportunities for reflecting on the insights acquired from the experience (a crucial step for informal learning to take place). For this to be effective, we need to set up a blended learning environment that will be organized as follows.

First, it will be necessary to build participants' basic knowledge of virtual team functioning and their awareness of the specific issues to be taken into account when working as part of a virtual team. English language skills will not be part of the training provided, because they are not a specific requirement of virtual teaming and in any case require longer-term training for significant improvement to take place. Consequently, the programme will begin with a one-day seminar providing introductory declarative knowledge on the three main subject areas identified in our exploratory research (see table 2): project management skills specific to

virtual teams, leadership methods and processes typically found in virtual collaborative settings, and general insights into cross-cultural issues. The aim of this seminar is to provide a targeted introduction to the principles underpinning the functioning of virtual teams, and to create a positive atmosphere between virtual team members and trainers that will facilitate the entire learning experience. Indeed, from the trainers' perspective, one of the main purposes of this live meeting will be to establish a strong psychological contract with the leaders and members of the participating virtual teams.

The next steps in the training will take place in an e-learning environment providing two types of ongoing support. First, the trainers will be available to be consulted throughout the entire virtual teaming experience. Second, e-seminars and brief (TED-style) talks on specific issues will be offered to both virtual team leaders and members. They will be clearly labelled and organized by topic so that they may be easily located and viewed again as required, in line with specific emergent needs. They will be designed to provide practical guidelines that participants can apply to their real-life virtual team experience. Finally, the trainers will be ready to modify or add to the e-learning contents to cater for the specific needs of virtual team leaders and members as they unfold over the life cycle of the team.

Periodically, brief milestone sessions will be held, using a live meeting format. At these sessions, each virtual team will report and evaluate its progress in relation to the assigned technical task and associated intermediate deliverables, as per the work schedule jointly defined at the start-up meeting. From the learning point of view, each of these live milestone meetings will facilitate two main activities. First, in-depth analysis of the ongoing virtual team experience: participants will be given the opportunity to exchange views both with their peers and the trainers and this will entail sharing, critical analysis and discussion of their team's activity to date. Second, each milestone session will include a formal training component based on project management, social leadership and cross-cultural topics. The trainers will draw out the connections between the formal contents presented and the experience, observations and events previously reported by leaders and members, and guide participants to identify appropriate next-step learning tasks. This will also help the trainers to define the e-learning resources required by leaders and members at the next stage in their learning process. It is critical to take into account that as participants gain more experience, the trainers will increasingly be challenged to provide personalized insights and inputs that are relevant to the specific characteristics of individual teams and their members.

When the team is close to completing its assignment, a final meeting will be held to wind up the training programme. Each virtual team will present its internal client with the outcomes achieved in relation to its assigned task. It will also be required to submit a short report on the main lessons learned by the team in terms of virtual teaming skills.

This blended learning approach offers at least four advantages. First, it has the potential to foster the development of the wide range of knowledge, skills and capabilities required to successfully contribute to international virtual teams. In designing it, we drew on our ad hoc analysis of the training needs of virtual teamers, which indicated that both formal declarative and knowledge and the competence acquired from hands-on virtual team experience are required. We thus developed a training setting and a learning process to match this evidence, in which declarative knowledge allows virtual team members to situate their practical experience to date within a framework of meaning, while experience provides them with the opportunity to reflect on 1) their own and other team members' behaviours, feelings and outcomes, 2) technical, multicultural, linguistic and soft-skill factors, 3) successful modes of contributing to virtual teams based on lessons learned and guidelines that have become personal capabilities.

Second, a blended learning approach such as this affords the opportunity to learn virtual teaming skills in a supportive environment, which is the optimum condition for learning. Having to work with other cultures, languages, and behavioural approaches can generate considerable stress for inexpert team members. By guaranteeing constant support to learners and institutionalizing a learning process within the organization, we will provide a setting that is simultaneously both reassuring and goal-oriented. Its message to learners is: "of course you are expected to attain this goal by participating in a virtual team. But you are not alone. You can bank on us: we will provide you with ongoing backup and help you to address any issues you encounter, whether technical or behavioural".

Third, this blended learning proposal is fully in line with the learning approaches adopted in advanced organizational settings, in which learning activity is embedded in – or at least very close to – daily practice. These approaches are not only defined by organizational constraints (time, costs): more importantly, adult learning requires experiential training approaches, in which formal learning is rooted in informal, practical and situated learning that is practice and by multimodal way [75, 78, 79, 80, 81, 82].

Fourth, the proposed training method will ensure that participants also develop capabilities preparing them to help colleagues facing similar challenges in the future. Thus, they may be expected to act as "champions" in the context of further training initiatives, aimed at disseminating virtual team competences among their more inexperienced colleagues.

EXPECTED BENEFITS OF THE PROPOSED BLENDED LEARNING APPROACH

1. Cross-fertilization between formal and informal learning
2. Supportive and reassuring learning setting, though goal-oriented
3. Fit with adult learning theories as well as organizational constraints
4. Learners as future champions in dissemination programmes

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5. Conclusion

The aim of this research in progress paper was – by identifying the specific training needs of relatively inexperienced virtual teams – to define a role for T&D in enabling effective virtual teams and to propose a suitable learning approach for developing the knowledge and skills needed for successful virtual collaboration. Based on the results of this preliminary stage, we have developed an intervention research model to be adopted in a future study on the role of blended learning in supporting virtual teams.

Three levels of analysis have been taken into account in this research: first, the factors likely to influence the effectiveness of a virtual team; second, the needs and challenges related to the early stages of the virtual team's life cycle; third, the role of the human resource function in promoting – via T&D initiatives – the knowledge and skills needed for virtual teams to be effective and successful.

We interviewed five employees of an information-oriented organization who had recently been assigned to global virtual teams in the context of a joint venture partnership. The interview protocol was informed by Bal and Gundry's model of effective team working [1], [52], which sorts the factors influencing successful team working into three main areas: people, processes and technology. We obtained four main outcomes.

First, the issues perceived as most critical when working on virtual teams concerned processes and people. Technology was only of slight concern or not at all, as perceived by our informants. It is possible that the technological solutions and tools provided by Nielsen are so user-friendly that they do not pose a challenge.

Second, leadership was seen as playing a crucial role in the success of virtual teams, especially in relation to building trust and solidarity, defining shared objectives and tasks, identifying mutual interest, and promoting internal legitimacy; leading the decision making process, driving and sustaining commitment; providing tailored technical and social guidance to meet the changing needs, skills, competencies and behaviours over the life cycle of the team. Indeed, not only did leadership processes emerge as the most important contributor to effectiveness and success of virtual teams. Surprisingly, and in keeping with an emergentist perspective, a social dimension of leadership was also identified. In the emergentist view, leadership is an outcome of group dynamics [66], so rather than there being just one formal leader, the leadership function may be shared among team members [67]. Consequently, leadership is not only an individual, but also an organizational trait [69]. In light of this theoretical framework, we believe that the construct of social leadership [72] came particularly strongly to the fore in this exploratory study and merits further study.

Third, our findings suggest a twofold role for the HR function in promoting the development of virtual teaming skills and competencies. Specifically, the HR department must provide formal training initiatives aimed at reinforcing and amplifying the informal learning acquired from hands-on involvement in a virtual team. This applies to both leaders and members. The main areas in which technical and relational knowledge and competences need to be developed are English language skills, project management, leadership and cross-cultural issues, specifically in relation to virtual contexts. In addition, HR should sustain, promote and reward the informal learning acquired in the course of virtual team activities, as well as organically linking formal and informal learning opportunities. In short, on-the-job training must be associated with formal training and development initiatives delivered by HR.

Fourth, our exploratory study also pointed up the importance of the multicultural dimension of virtual teaming. Participating in a virtual team appears to strengthen members' feeling of being included in the organization, and makes their national identity less significant to them than belonging to a culturally varied team. More generally, working on global virtual teams allowed members to build up a more comprehensive view of the workings of their organization. Thus, the creation of virtual teams breaks down barriers and creates opportunities for collaboration that in turn foster the development of a multicultural perspective.

These outcomes prompted us to develop and propose a blended learning training programme designed to develop virtual teaming knowledge and skills. The particular blended learning approach that we suggest provides for the enhancement of a wide range of knowledge, skills and capabilities that are relevant to participating in virtual teams at the international level. It is also fully in keeping with the current learning approaches of choice in advanced organizational environments: by meaningfully linking formal and informal learning opportunities, it will encourage, reinforce and reward informal learning acquired during hands-on virtual team experience. Furthermore, it offers participants a supportive learning setting that reliably delivers ongoing backup from trainers and colleagues, while remaining goal-oriented and meaningful from the organizational point of view.

Finally, we expect that participants in the proposed blended learning programme will also develop the capability to help colleagues facing similar challenges in the future. This means that our advocated approach may also be exploited to disseminate virtual teaming skills more widely throughout the organization.

This qualitative study offers a starting point for a larger-scale project aimed at analysing the effect of a HR strategy based on training and development on the efficacy of virtual teams. Although the preliminary phase presents a number of limitations such as the small sample size and convenience sampling method used, its end goal was to gain fresh insights from which to develop new hypotheses for testing at the subsequent confirmatory step in our research programme. We therefore plan to conduct a new research project that will measure, on the one hand, the contribution of social leadership and cultural intelligence to the effectiveness of virtual teams, and on the other, to further test the effects of formal and informal training on virtual team performance. Indeed, our exploratory investigation not only indicated that social leadership skills and cross-cultural

competences play a key role in the functioning of virtual teams, but also pointed up specific non-technical training needs on the part of team members and suggested that virtual teams may provide particularly learning-inducing environment. As social learning frameworks suggest [73], observing and interacting with colleagues who have greater experience of virtual teaming may help newcomers to develop the knowledge and skills required for effective virtual teamwork. Therefore, we expect that social leadership and cultural intelligence will positively influence virtual team performance (H1). Furthermore, we expect social leadership and cultural intelligence skills to be enhanced as a consequence of joining virtual teams (H2). Finally, we expect that for virtual team members, receiving formal as well as informal training in project management, social leadership and cross-cultural skills will foster the development of their abilities in these areas more than will experiencing informal learning only (H3).

In order to test these hypotheses, the future study will adopt a quasi-experimental design [83].
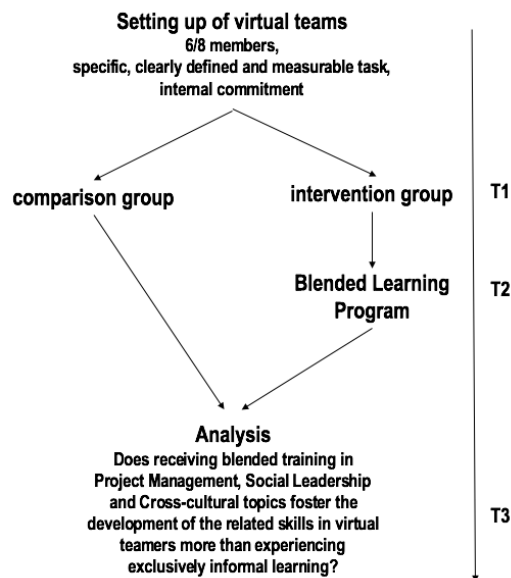
Figure 3. The next step: research design

At T1, during the early stages of virtual team membership, we will measure team members' project management, social leadership and cross-cultural skills as well as the team's overall efficacy. At T2, the organization, assisted by the researchers, will provide specific training in project management, social leadership and cross-cultural topics to the virtual team leaders and members assigned to the virtual team intervention group. At T3, the measures administered at T1 will be repeated. We will then analyse whether gains in project management, social leadership and cross-cultural skills have influenced the efficacy of virtual teams, while controlling for the effects of baseline skills – as measured prior to delivery of the blended learning programme – and selected demographic variables (see Fig. 3). The study will be conducted with Nielsen TAM employees based in units that are still at the early stages of virtual team adoption, having only recently been acquired by Nielsen.

We hope that our findings to date have contributed to identifying the specific training needs perceived by inexperienced newcomers to international virtual teams, as well as to defining a learning approach designed to meet these needs and create the optimum conditions for effective virtual teams.

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Tables

Rel.	First-order categories	Second-order categories	Aggregate dimensions
*****	focus on the activities/functions of the team leader: giving advice, leading decision making, building/maintaining trust and solidarity, defining shared objectives, common tasks and mutual interest, as well as reinforcing internal legitimacy. The team leader also has to adapt his/her actions in line with the development of the team	Team facilitation	PROCESS
*****	forms, feedback processes, repository, and cloud solutions required to keep team members in contact with one another and give them access to updated work progress information. opportunity to track the actions of other team members promotes integration.	Alignment	
***	meeting agenda, in order to create momentum for the virtual team and maintain commitment over the time. meetings must follow a set organizational format, so that team members are aware of what preparation and actions are required before, during and after a meeting	Meeting structure	
*	little reference made to performance measurement	Performance measurement	
*****	need to identify the most appropriate size of team (trade-off resources/neatness) and to select members based on clear criteria, such as whether they hold the task-related and non-task-related skills and abilities required by virtual teams (the most frequently mentioned were training, knowledge, language ability, time orientation and general expertise)	Team selection	PEOPLE
*****	mainly not financial in nature: approval from team leader and other team members, enhanced reputation, endorsement and acknowledgment	Reward structure	
*****	specification of personal objectives (in terms of setting goals and clarifying roles and responsibilities: transparency) and team objectives (usually defined during initial discussions among team members	Specification of objectives	
*	need to leverage on existing skills, knowledge and organizational choices to ensure effective meetings	Meeting training	
**	need for the data shared among team members to be stored in a protected area	Security	TECHNOLOGY
*	virtual teams apply technologies already used within the organization	Selection	
/	/	Location	
/	/	Training	

Table 1. Perceived key factors influencing the efficacy of virtual teams

First-order categories	Second-order categories	Aggregate dimensions
Functioning effectively and successfully contributing as a member of a virtual team means being familiar with the cultures, behaviours, social rules and habits of the other members	Cross-cultural	PEOPLE
Need to develop the specific competencies and skills of effective and successful virtual teamers (both leaders and members) given that traditional competencies and skills are inadequate for virtual environments	Project Management specific to virtual environments	PROCESS
Main activities and responsibilities of the virtual team leader concern people and processes (see table 1)	Leadership	PROCESS AND PEOPLE
Training needs rooted in the history of the unit	English language competence	PEOPLE

Table 2. The role of formal learning in sustaining effective virtual teams