Creative Multidisciplinary Convergence and Technologies

Basic Organizational Concepts for
Higher Education Projects and Programs

Commission on Creative Multidisciplinary Convergence

Council of Arts Accrediting Associations

COUNCIL OF ARTS ACCREDITING ASSOCIATIONS

Commission on Creative Multidisciplinary Convergence

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Preamble

The arts and design disciplines have worked together and with available technologies for thousands of years. Together they have coevolved. Today this work and evolution proceed but in conditions of expanded possibility. Emerging technologies are developing at a rapid rate. Students are already oriented to the culture produced by creative multidisciplinary convergence and technologies (CMCT). The powerful fundamental principles of the creative art and design disciplines continue to serve as the basis for new creation. CMCT exists at the convergence of these two realities. The frequency and scale of new relationships involving the arts, design, technology, and other disciplines is growing as new opportunities and challenges for creative engagement develop.

As institutions explore various CMCT prospects and opportunities, and as experts in the various arts and design are involved, it is important to maintain the presence and integrity of the creative process as an essential aspect of the synergy. This is true whether the result is intended primarily as personal expression, mass market product, or anything in between.

CMCT efforts impact all aspects of organization, project development, and program delivery. The following concept papers pose questions and suggest approaches to various basic conceptual and operational areas. They provide a map of essential considerations for local users. Decisions about specifics will be as varied as multidisciplinary multimedia projects themselves.

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I. Overview

1. The arts and design disciplines have worked together and with available technologies for thousands of years.

2. Multidisciplinary, multimedia, and convergence are long-established concepts in all mediums of creative expression and scholarly research.

3. The current CMCT evolution is a special byproduct of a structural transformation in the way information is processed and distributed. Disciplinary and multidisciplinary concepts and creativity are now allied with digital technology to create new kinds of convergence.

4. This transformation enables new possibilities.

5. The arts/design are inspiring technological development, and technological development is inspiring the arts/design. The same evolution is happening in other fields.

6. Moreover, the arts/design are converging with other fields, and other fields are converging with the arts/design.

7. The result: a dynamic, creative, non-linear world that fosters discovery.

8. New combinations and syntheses of knowledge and practice yield new discoveries that:

    a. do traditional things in new ways;

    b. use traditional things in different ways;

    c. create innovative things.

9. These combinations and syntheses both engage and generate high levels of complexity and increase expectations regarding new possibilities.

10. Complexity tends to grow exponentially with each increase in the number of things combined.

11. This new paradigm necessitates new connections and collaborations that:

     a. occur among art/design forms and other disciplines, concepts, persons, departments, techniques, technologies, etc.;

     b. require dedicated resources (time, money, personnel, facilities and equipment, long-term commitment, etc.);

     c. pose administrative challenges (organization, credit, payment, logistics, scheduling, funding, evaluation, etc.);

     d. address students' needs.

12. CMCT engagements are based on new connections and combinations, the scope of which can range from specific projects to professional studies.

13. CMCT projects are often more complex than they seem at the start; therefore, it is important to take into consideration two essentials:

     a. basic purpose; and

     b. clarity about breadth and depth of engagement.

14. To determine purpose, begin with a creative vision. Be sure concepts, content, people, and specifics of the project are able to support the vision. Let these choices shape decisions about breadth and depth of engagement and resources. Do not start with computers, labs, software, etc., but focus at first on the specific creative process and/or results expected. Identify the creative problems you wish to solve as the basis for finding the technology and other resources needed.

15. Beware of large technological investments or agreements that can lock programs into patterns or situations that are quickly outdated.

16. Build in ways that sustain the ability to be flexible. Projects often change and evolve rapidly.

17. Study and research to understand the entirety of what is needed to sustain fulfillment of a specific CMCT purpose at the level of engagement chosen.

18. For each specific project, invest time in determining and understanding the necessary components. This provides the basis for structuring and nurturing relationships among these components.

19. The success of any project hinges on open levels of effective communication among all participants and relevant parts of the organization.

20. Anticipate and enjoy the challenges inherent in:

    a. systems integration among the fields involved;

    b. helping students expand their horizons for conceptual thinking;

    c. facilitating collaboration;

    d. dealing with evolving complexity;

    e. maintaining conditions that enable quick course changes;

    f. making decisions in a dynamic environment.

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II. Definitions and Concepts

1. **Multidisciplinary**

   a. **Disciplines** are ways of knowing and ways of doing. Disciplines are evolved activity and resource groupings that comprise a specific body of teachable knowledge with its own background of education, training, procedures, methods, and content areas.

   b. In these concept papers, **multidisciplinary** refers to an activity in which more than one discipline seeks a common creative purpose. This may include various forms of disciplinary combination. See items 10-13 below.

   c. These may be arts or design disciplines or others (history, sciences, engineering, medicine, etc.)

   d. **Multidisciplinary** work requires that all disciplines involved participate in the creation of the final product (i.e., a collaborative relationship among disciplines, not just one discipline using concepts or technologies from another discipline, or one discipline serving another). Not all disciplines involved in multidisciplinary projects need to be equally or even always involved in every project.

   e. Representatives of each discipline contribute their knowledge, skills, and expertise which feed into and inform the central concept of the final product.

2. **Creative Convergence and Multimedia**

   a. **Creative Multidisciplinary Convergence and Technologies (CMCT)** is defined as the active involvement of more than one discipline in the combination of two or more content forms and media through use of emerging technologies to create art or design or works/productions with significant arts/design content or presence.

   b. In its most basic definition, work featuring **creative convergence** has existed for hundreds of years: spoken text and movement in theatrical presentations, printed text and still images in books, and piano rolls providing musical accompaniment for moving images are all examples. This convergence is sometimes referred to as "multimedia." The modern definition of multimedia

still includes the combinations of two or more content forms. "Convergence" includes combinations, but also connotes a fusion of elements and today normally implies explicit uses of digital and emerging technologies.

c. In these concept papers, the term **creative convergence** refers to the combination of two or more content forms (sound, still images, moving images, text, movement, interactivity, etc.), i.e. **multimedia**, particularly through the use of digital and emerging technologies.

d. **Creative convergence**, **multimedia**, or **digital media** work may be done entirely within the context of one discipline. In such cases, there is only one discipline guiding the conceptual and creative work, though multiple content forms and convergences may be used in the creation and final presentation.

e. The term **creative multidisciplinary convergence and technologies (CMCT)** is intended to encompass forms and technologies that constitute means for producing work and to indicate a melding of means through technology. Artists and designers make choices among these means as they create and realize specific works, productions, or products. Other terms such as multidisciplinary multimedia or digital media, interactive media, new media, emerging media, etc. may carry the same meaning for others. These papers focus on the thing that is being done more than what it is called. The name will evolve over time.

3. **Arts/design** encompasses all the individual performing and visual arts and all the various design fields, including those disciplines, manifestations, and practices that combine arts or design elements in traditional or new forms. In these papers the "arts" refers to all the visual and performing arts and "design" refers to all the various design specializations.

4. **Technology**, singular or plural, encompasses all types of technology, current, past, and future. However, most uses refer to electronic, digital, and/or emerging technologies.

5. **IT** is used for many different purposes and serves different functions. In CMCT contexts, IT is focused on supporting creative, scholarly, and pedagogical work.

6. **CMCT** — Shorthand for work in creative multidisciplinary convergence and technologies.

7. **Project** — A set of linked activities that use multiple resources to create an end product.

8. **Synergy** — A conjunction of forces that enable the whole to become greater than the sum of its parts. For example, core functions and technologies can interact synergistically to drive the evolution of new disciplines.

9. **Scale** — Relative proportionate size or extent of the work being done. In these concept papers, scale often is used to describe the degree to which the dimensions of a project can be changed to either larger scale or smaller scale.

10. **Pluridisciplinary*** — Juxtaposition of disciplines assumed to be more or less related (for example, mathematics + physics, or French + Latin + Greek = "classical humanities" in France). A collection of courses satisfying distribution requirements in the humanities would most likely be pluridisciplinary.

11. **Crossdisciplinary*** — Imposition of the approaches and axioms of one discipline on another. A literature course that analyzed a novel by utilizing the musical structure of exposition, development, and recapitulation would be crossdisciplinary.

12. **Interdisciplinary*** — An adjective describing the interaction among two or more different disciplines. This interaction may range from simple communication of ideas to the mutual integration of organizing concepts, methodology, procedures, epistemology, terminology, data, and organization of research and education in a fairly large field. An examination of how the ideals of the Enlightenment had influence on and were synthesized in 18th-century literature and dance would be interdisciplinary. An interdisciplinary group consists of persons trained in different concepts, methods, data, and terms organized into a common effort on a common problem with continuous communication among the participants.

13. **Transdisciplinary*** — Establishing a common system of axioms for a set of disciplines. For example, anthropology is considered "the science of human beings and their accomplishments."

*The definitions are based on those found in *Interdisciplinarity: Problems of Teaching and Research in Universities*, published by the Organization for Economic Cooperation and Development (OECD) in 1972.

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III. Preparation of Arts Professionals

1. To some extent, professional preparation in all artistic fields involves multidisciplinary work and experiences. Historically, the arts have been and continue to be combined with each other and with other disciplines.

2. With the advent of the digital revolution, the number and nature of potential combinations has expanded dramatically; more choices are open for students and for institutions. Furthermore, digital technology has generated whole new art forms, and society has changed dramatically.

3. During the next several decades, many arts professionals will find themselves integrating their disciplines with other fields and media.

4. Technological changes have created new possibilities for creative and scholarly expression with deep integrations of disciplinary and multidisciplinary concepts, techniques, and technologies. These produce new combinations and new kinds of convergence.

5. Arts/design professionals may engage these possibilities at various levels from no participation to total immersion and lifetime exploration.

6. Institutions preparing arts/design professionals may also engage at various levels by providing, for example:

   a. supportive environments for individual engagement and presentation of work;

   b. general introductory information or overview courses;

   c. incorporation into common body of knowledge and skills requirements;

   d. elective courses on specific topics;

   e. independent projects and study;

   f. specific skills development sequences;

  g. basic professional foundation (minors or areas of emphasis);

  h. professional development sequences or curricula (majors);

  i. advanced or graduate-level engagement.

7. Institutional engagement may be:

  a. project based; or

  b. a new program or offering having reciprocal relationships with existing programs and offerings.

8. The technology, technique, and content of CMCT are extensive and constantly changing.

9. This produces a dilemma:

  a. It is necessary to master the technology to the extent necessary for basic operations and for understanding of what technology can do; however,

  b. technologies and techniques students and faculty learn will evolve quickly and could soon be outdated.

  c. CMCT professionals need content knowledge and conceptual skills that can inform both present and future project development, and specific uses of technology.

  d. The relationship of these needs is critical in determining distributions of curricular and project time.

10. Students interested in multidisciplinary multimedia work arrive with a variety of interests, knowledge, and skills in one or more art forms and technologies. Many will have produced CMCT works; learned by trial and error, experimenting, and observing through interactive media; and been engaged in independent research into what interests them.

11. To some extent the above learning and working processes are indigenous to professional work in CMCT.

12. These processes have implications for admission requirements, curricular organization, and approaches to teaching, especially for students who wish to work professionally in this field.

13. For students seeking to develop professional competence as creators of CMCT, several basics [items 13-17] have emerged:

    a. In the production of CMCT work, individual ability to conceptualize and apply craft are essential, just as they are in all art and design forms; however, the scope of expert levels of aesthetic and technical skill required for professional CMCT production is beyond the competence of most individuals at the early stages of study and creative production.

    b. Deep expertise in one or a few things, general understanding of many things, and the ability to interact with the expertise of others.

    c. For professional CMCT artists/designers, deep expertise in one art form or design specialization is a natural and positive starting point, but not the only starting point.

    d. Whatever the starting point, single discipline expertise is joined with expertise in other disciplines.

14. To build capabilities in multidisciplinary multimedia, to generate concepts and projects, and to explain, converse, and work with other experts at both the individual and institutional level the following informational knowledge is basic:

    a. **The Vocabulary of Practice** — what basic words and concepts mean in the home discipline, other arts/design and other disciplines, the processes of creative convergence and various technologies, etc.

    b. **Fundamental Generative Processes** — the way work is created in the various art and design forms, in technology and in CMCT. Includes basic components and techniques, creative patterns, problem solving, and formal relationships.

    c. **Notational Systems** — the natures of notational systems and what they do in the various arts and in technology.

    d. **Editing Systems** — procedures, processes, and criteria for synthesizing and determining final compositional, design, or technical decisions.

    e. **Phases of Production and Distribution** — sequences for the art forms, for design, for technology, and for work in CMCT.

15. The following conceptual knowledge and skills are critically important:

    a. Ability to follow, understand, and relate creatively from one's own perspective to ideas expressed in visualizations, sounds, stories, motion, and combinations thereof.

    b. Understanding of the structures and properties inherent in various disciplines and media, e.g. spatial, temporal, and/or algorithmic.

    c. Ability to organize content, space, and time in various contexts of CMCT work.

    d. Understanding various concepts of response and interactivity and critical distinctions between creator/responder and the ability to work with these distinctions to inform creative applications.

    e. Understanding the characteristics, capabilities, and limitations of various technologies and the ability to leverage them to achieve specific expressive, functional, and synergistic purposes.

    f. Understanding of the nature and procedures of collaborative work.

    g. Competencies in writing and effective communication.

    h. Abilities to conceptualize, capture, create, and edit in various media using programming codes and/or software packages. Associated competencies include understanding of digital multimedia capabilities and uses of light, images, animation and film, sound, and texts.

16. Many other competencies are ideal and include, but are not limited to, historical and theoretical knowledge, analytical skills associated with creative process, and knowledge of discovery processes and other forms of complexity.

17. The result must be the ability to cooperate, synthesize, integrate, and deal with complexity in the creation, development, and analysis of professional quality CMCT work.

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IV. Goal Setting

1. General Purposes and Goal Setting in Higher Education

    a. CMCT is present, used, and pursued in many ways, including:

        (1) pervasively — as a growing cultural environment;

        (2) pedagogically — to inform and enhance teaching and learning;

        (3) educationally — to introduce, provide overview understanding, and to study;

        (4) artistically — to create new work or new productions and interpretations;

        (5) experimentally — to conceive and build new expressive and technical capabilities;

        (6) administratively — to manage information and other systems;

        (7) developmentally — to prepare future professional artists, designers, scientists, engineers, etc.

        (8) commercially — to design, create, and market products

        > ***Decision point:*** *What is our local purpose? Among multiple possibilities and combinations, what are we going to pursue?*

    b. The answer is heavily dependent on the expertise and commitment of available personnel. Institutionalized CMCT work is primarily faculty and staff driven.

    c. The answer is also dependent on resource availabilities now and in the future.

    d. The answer needs to be pursued to specificity, particularly with regard to breadth and depth of engagement. (See 2.d. below.)

    e. The goal of an iterative planning process is to create relationships that function effectively. For each purpose the components need to be right, and the relationships need to be right as well. Synergy is the objective.

f. Regardless of the process utilized, effective project management is essential.

2. Goal Setting: Professional Preparation of CMCT Artists and Designers

a. Goal setting is essential in order to support the integrity of the creative educational vision in terms of people, processes, and resources.

b. Setting goals in terms of the nature of the field. CMCT:

(1) uses what is available to create new, different, interesting work, operations, and results;

(2) avoids questions such as the *right* way to think about art or design or any of their forms;

(3) works pervasively in non-linear ways and patterns, a contrast to the linearity of most curricula;

(4) is project driven, goals are regularly expressed as projects;

(5) builds projects and general capabilities through entrepreneurial means;

(6) seeks combinations, interactions, integrations, and syntheses, often unique to a project;

(7) thrives on pursuit of discovery, creativity, experimentation;

(8) requires the ability to compose or design with knowledge and skills;

(9) involves teams of experts able to work together.

> **Decision Point:** *How compatible is the nature of this field with the nature of what we do now or can do in the time frame under consideration? How much cultural change at the institutional level will be necessary to begin or advance further?*

c. Setting goals in terms of the nature of resources required. CMCT professional preparation programs need:

(1) faculty and staff that produce or participate in CMCT work;

(2) time (curricular, student, faculty, staff, administrative);

(3) schedules heavily oriented toward student practice and experimentation;

(4) space that conceptually and operationally is considered and funded as an experimental lab;

(5) current hardware and software consistent with program goals;

(6) administrative frameworks, funding, and assessment systems consistent with the nature of creative exploration and innovation;

(7) diplomacy associated with consortia, collaborations, and cooperative efforts among disciplines;

(8) facilities to show work on a regular basis (access, suitability, safety).

> ***Decision Point:*** *How compatible is the nature of resources required in this field with the nature of what we do now or can do in the timeframe under consideration? How much cultural and organizational change will be necessary to begin or advance further?*

d. Setting goals in terms of scope or breadth/depth of engagement. For CMCT programs:

(1) Scope decisions are critical in determining matching resource needs with specific objectives; expansions of scope usually mean expansions of resources.

(2) Scope may be discovered and tested by starting with a single project, and then adding additional projects, a course before a curriculum, for example.

(3) Initially, the smaller the scope, the smaller the risk of decisions that inhibit flexibility, channel resources unproductively, or produce bad history that reduces support.

(4) Aggregations of project experience usually develop a sense and definition of scope that is realistic based on local resources, especially personnel and patterns of cooperation.

(5) Scope decisions about professional education and training programs are especially critical given the vastness of possible subject matter, limitations of time, and the evolving nature of professional work.

(6) Scope decisions need to set frameworks and boundaries compatible with the natures of the field and its resource needs.

> ***Decision Point:*** *Given your present situation, what scope of CMCT work has prospects for success?*

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V. Personnel

1. Faculty and Staff Qualifications and Experience

    a. Institutional expectations of credentials, experience, and achievement qualifications for various component disciplines and operations of CMCT depend in large part on:

        (1) the nature of CMCT work,

        (2) institution's specific goals for CMCT, and

        (3) the nature of the institution's requirements for faculty in arts/design or other creative disciplines.

    b. Due to the emergent nature and rapid expansion of the digital domain, traditional academic assessment criteria may need to be adjusted to field-specific criteria consistent with the institution's specific goals for achievement in CMCT.

    c. Interest, aptitude, experience, demonstrated achievement, and specific project buy-in are often better qualifications for combining and synthesizing component disciplines than formal, academic, professional credentials in a traditional or new field.

    d. Project and networking experiences with faculty and staff reveal capabilities and orientations for the achievement of local CMCT objectives and thus inform criteria and methods for choosing personnel.

    e. Qualifications include the ability to:

        (1) bring deep expertise and technical facility in some body of content to collaborative efforts and programs;

        (2) explain and otherwise articulate or notate artistic and technical concepts and issues, especially to those in other fields;

        (3) research and effectively communicate complex ideas associated with the collaborative process;

(4) teach: sponsor, guide, and assist the development of student competencies and projects in CMCT;

(5) build, participate in, and oversee multidisciplinary teams;

(6) nurture and manage CMCT projects of various types and sizes;

f. Qualified personnel may come from many sectors: full-time faculty, staff, adjuncts, industry employees, graduate students, personnel from other educational institutions.

g. Medium- to large-scale CMCT efforts normally require a project manager who coordinates fulfillment of technical and technological requirements.

h. Staff support commensurate with the scale of projects and programs is essential.

2. Personnel Deployment and Time

a. Collaborations are intensive. Projects of any scale involve arts, design, and other content and technical means. Often, two or more professionals are needed to provide the level of expertise and sophistication required.

b. Mentoring, project-based work, and lab oversight and management are critical parts of the overall time and deployment issue.

c. Translations of time to credit may produce challenges due to the contrasting natures of CMCT and work in other disciplines, especially at the undergraduate level. The arts and design may have an advantage in this regard, being used to focusing on creative development within the frameworks of academic structures.

d. Alternative models for time allocation and personnel assignment may be necessary to achieve creative and educational goals.

3. Sources for Professional Development and Reorientation

a. Self-motivated and self-directed professional development and reorientation have generated the expertise, aspiration, and energy now evident in the field. Indeed, it has created the field.

b. Optimum professional development or reorientation may be obtained in many cases by a working association with a project.

c. Knowledge of what is happening and work being produced is a critical part of professional development.

d.   Professional organizations concerned with multimedia offer meetings, conferences, workshops, seminars, demonstrations, and other services.

e.   Web sites also provide information and professional exchange.

f.   Virtually all software is the subject of tutorials.

g.   Component disciplines are the subject of readily available courses and readings.

h.   As structured CMCT programs grow, so do opportunities for experience and study in synthesis and integration.

4.   Reward Systems Issues

a.   Providing mechanisms to calculate individual credit for work accomplished by a team.

b.   Using single departmental rewards criteria for the efforts of multi-departmental consortia.

c.   Negotiating and managing reward systems for collaborative projects and programs within and across multiple administrative units and institutions.

d.   Developing standards and protocols for addressing collaborative work in promotion and tenure.

e.   Developing evaluations that support reward systems at all levels in terms of:

(1) Dealing with the essential functions of disciplinary, multidisciplinary, and technological currency, individually and for the department or CMCT group.

(2) The institution's definition of publication in CMCT.

(3) The institution's definition and practices for peer-review in CMCT.

(4) Connections and distinctions between theory and practice.

f.   Remembering that questions of quality and value will be raised in environments where component disciplines have long practice and achievement records, but CMCT is new, experimental, and exploratory in both artistic and technical dimensions.

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VI. Resources

1. Project-Based Equipment and Resource Acquisition Systems

    a. Start with what you want to do: open experimentation, specifics regarding a work of art/design, a course or curriculum, a set of goals for knowledge and skill acquisition, etc. Correlate what resources you need to have with the specific resource needs of the projects you undertake.

    b. Develop an experimental space and conditions in which experimenting, prototyping, and clarifying of the problem may occur.

    c. The project-based approach is important because the most sophisticated hardware and software is expensive to obtain, upgrade, and replace. Equipment rental is costly. Over-purchasing can be wasteful given rapid changes in capacity, cost, and speed. When considering purchases, evaluate not only usability but also reusability, or the potential uses of the equipment for future projects.

    d. Avoid unnecessary duplication by gaining a clear understanding of what is already available and what is projected for the institution as a whole before making specific purchases or program investments. A culture of borrowing is appropriate.

    e. Based on the results of any prototyping activities, seek clarity and accuracy about the complete resource costs for each project, including such issues as wiring buildings, productions, and projects; software and hardware; production equipment; licenses; space and facilities; learning and research resources; etc. Add these to personnel and time costs.

2. Relationships with Existing Resource and Support Staff (ERSS) – includes but may extend beyond IT personnel

    a. Effective and ongoing communication with ERSS is essential to achieve creative and educational goals.

    b. Projects, on whatever scale, are the primary basis for work with ERSS.

    c. Develop reciprocity with ERSS so that the knowledge and skills of ERSS are utilized productively to achieve artistic and educational goals.

d. Realize that the cultures of ERSS and the arts disciplines may be quite different, and proceed accordingly in the development of a relationship. Process and communication styles may also be different.

e. While educational goals are the purview of faculty, consideration should be given to the creative team in the development of artistic and project goals. Be wary, however, of acquiescing to a culture that conflates technological knowledge with artistic knowledge, for example, how the composition and design processes work in the various art and design forms, the nature of aesthetic decisions, the aesthetic communication goals for specific projects, or the design of curricula to prepare arts professionals or designers. Both artistic knowledge and technical knowledge contribute to the creation of work.

f. Consult and work with ERSS on technical issues such as project feasibility, future hardware and software projections, capabilities of available equipment, and technology purchases.

g. Buy things that ERSS can service.

h. Work closely with ERSS on issues pertaining to security.

3. CMCT Working Space

a. Professional programs with majors in CMCT require one or more working spaces.

b. Whatever the CMCT project or program, working spaces are the locations for:

    (1) development of coherent creative action (dissimilar things going different ways, but working together);

    (2) individual and collaborative study, exploration, and work;

    (3) systems integration (artistic [e.g. composition, choreography, playwriting or narrative, visual design] and technological);

    (4) project fulfillment and artistic production;

    (5) development and maintenance of a creative environment;

    (6) installation, access, maintenance, and storage of equipment.

c. Working spaces include computers and other technologies, but also studios, demonstration sites, and performance venues for CMCT.

d. The composite of working spaces may include traditional preparation spaces such as scene shops and rehearsal halls, but may also include digital work spaces to support programming, editing, recording, etc.

e. In addition, new categories of virtual spaces are evolving and may provide new places for collaboration and creative work.

f. Access, safety, and security of all spaces are critical and specific policies and oversight is needed.

g. Authority, accountability, and responsibility for CMCT working spaces need to be clearly stated, understood, and shared by all constituencies.

h. Appropriate equipment, space for storage, and currency of equipment and software need to be considered.

4. Intellectual Resources

a. In addition to the usual resources for the arts and technology, CMCT programs need access to image, video, sound, and other libraries and assets, both those they acquire and those that are created by individuals working in the program. These become part of the raw material of CMCT work.

b. Participants in CMCT programs need access to the range of current work in this field.

c. Resource issues include appropriate hardware and software, and fees for licensing and royalties.

d. Issues related to copyright, fair use, and legal aspects of the use of digital assets – acquired or created – need to be addressed.

e. Students need to understand the ethics and practices associated with intellectual property.

f. Mechanisms for archiving CMCT work need to be developed.

5. Professional Development

a. CMCT faculty and staff will need professional development and support for all reasons applicable to programs in other fields.

b. Some personnel will need to be engaged in professional development outside their home discipline and even outside of traditional academic professional development activity.

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VII. Organization and Management Issues for Administrators

1. Dealing with personnel issues. For example, CMCT initiatives often come from individual faculty and student interest. Challenges include nurturing work in relationship to operations and the continuing program.

2. Welcoming and developing creative environments for CMCT study and work.

3. Finding projects of a scale that can be addressed with tangible and intangible resources available, especially at the beginning.

4. Correlating specific projects with the full complement of resources needed to begin and continue to conclusion or over time.

5. Developing structures and patterns of responsibility and authority that facilitate work rather than stifle it.

6. Coordinating fields, disciplines, and individuals with disparate cultures, habits of mind, and criteria for success.

7. Facilitating relationships and interactions as projects proceed.

8. Applying planning goals and predetermined parameters in terms of efforts that are exploratory and thus not predictable.

9. Creating internal project reporting mechanisms that allow each participant field to report in terms their field understands while remaining compatible with the reports of other participants to their respective fields. Or, creating large-scale progress reports understood by all fields.

10. Establishing confidence that in arts/design projects, artists/designers will be primarily responsible for quality assurance.

11. Developing CMCT demonstrations to generate support for projects and programs, or obtaining demonstrations from others.

12. Negotiating detailed understandings and agreements for collaborative and consortia work. Consortia may be within the administrative unit or external to it. Issues normally addressed include, but are not limited to:

   a. compatibility of structures and organizational patterns (i.e., how things work operationally and what similarities and differences mean for common effort);

   b. funding responsibilities and distributions;

   c. presentation formats, and availability of end result to all collaborators;

   d. public relations questions, including joint credit;

   e. networking levels needed to reach project goals

   f. project management and facilitation responsibilities;

   g. oversight responsibilities and their relationship to project management;

   h. facilities issues, particularly adequacy, use, scheduling;

   i. equipment costs;

   j. software licensing;

   k. libraries and information resources;

   l. resource support staff relationships; including IT departments if applicable

   m. time frames and time allocations;

   n. resource sharing;

   o. participant credit;

13. Establishing value through production and presentation of work, using each project as a basis for others.

14. Developing expectations and protocols for documenting the process and product for future use and dissemination.